

# AVIATION WEEK

A MCGRAW-HILL PUBLICATION

MAR. 24, 1952

50 CENTS



## Introducing the COUGAR... New Navy Jet Fighter

The F9F-6 COUGAR is a sleek, swept wing successor to the battle-proved Grumman PANTHER, the first jet used in combat by our Navy. Much faster than the "over 600 mph" PANTHER, the new COUGAR has the same low landing and take-off speed. This difficult performance combination is ideal for carrier and front line operations by Navy and Marine Corps pilots.

GRUMMAN AIRCRAFT ENGINEERING CORPORATION, BETHPAH

Contractors to the Armed Forces

## B.F. Goodrich

CARTRIDGE  
MODELRADIAL  
MODEL

Now being applied, as under consideration for various jet engines in these three models of Sandstrand's largest Turbo Constant Speed Drives. Since the main engine houses this type of drive, the drive itself is more compact, of lighter weight. Engine is a steel, eliminating a rupture of system. Insulation and maintenance are simplified as the alternator is easily bolted to or removed from the constant speed engine port. Higher efficiency is maintained, even at extremely high loads. The previous units, driven by power extracted from the engine shaft, are performed less than a 2 cycle frequency variation on 400 cycle drives. They are a direct result of Sandstrand's *reluctant* research, *rotary engineering*, and *precision production*.



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**A**LTIMITUDES of 8 miles or more need a small trouble-free plane's "greenhouse"—the pressurized Plexiglas canopy that fits over the cockpit. The inflatable seal between the greenhouse and cockpit would sometimes burst from the effects of low pressure on the outside. High pressure on the inside, forcing the air inside the greenhouse rush out

B F Goodrich engineers, called on by the manufacturer, studied the problem. A really effective inflatable seal, they figured, should blow up like a paper bag instead of like a balloon—expand and wet lower, outer pressure. Here's how they made it work: Here's how they made it work: They took a several billion rubber com-

on both sides, and vulcanized it in a cold-pressed position on a flexible rubber base. Inflated, the rubberized fabric simply lifted in sealing position with little or no stretching. Sealing was positively instantaneous, with pressure only a few pounds above that inside the canopy. Furthermore, it would inflate with less pressure at much 65° than old-type seals required at room temperature.

The new seal has other advantages, too. It has more resistance to wear and damage than ordinary seals. It fits complex curves better. It seals and unseals faster. Sliding wear and scuffing are minimized.

The new B F Goodrich seal is now used on more than a dozen makes of

plants, including the three just above: North American Solar, Inc., McDaniel Bunkers, bottom left; Marthop-Sent plant, bottom right. Two new types of steel in line of heavy American development that have come from NRC, leader in rubber research and engineering. Other is F. Goodrich produces butadiene, include nitrile, which is butadiene, butadiene, Di-Kelco, Avonite, Plastolite, Schenck, Primatex, Sealing, Zipper, fuel oils, Brevant, acrylonitrile. The B. F. Goodrich Company, Akron, Ohio.

**B. E. Goodrich**  
FIRST IN RUBBER





Forgings for the aircraft industry today demand the utmost in engineering and production techniques and in scientific laboratory control. This massive complicated landing gear component, weighing over 400 pounds, is typical of Wyman-Gordon's forging contribution to the ever-growing progress in aircraft design. In crankshafts for the automotive industry and in all types of aircraft forgings, steel and light alloy, Wyman-Gordon has pioneered in the development of forging "know-how"—there is no substitute for Wyman-Gordon experience.

*Standard of the Industry for More Than Sixty Years*

**WYMAN-GORDON**  
FORGINGS OF ALUMINUM - MAGNESIUM - STEEL  
WORCESTER, MASSACHUSETTS  
HARVEY, ILLINOIS      DETROIT, MICHIGAN

## NEWS DIGEST

### DOMESTIC

Grumman X2F-1 Jaguar is scheduled to begin flight tests at Edwards AFB, Calif., within the next few weeks. The big fighter with variable-geometry wings is powered by a 9,000-hp Pratt & Whitney engine in the 9,000-hp class.

Irons-Miller Aircraft Corp., a division of Lockheed & Western Aircraft, has one of its planes which carried 16,914 lb. of general cargo from Guam to New York, Mar. 9-10. Last mission on SG-47 DC-3s handled a record 14,616 lb. of cargo.

Donald A. Duff has resigned as executive vice president general manager of General Motors. Reports are that the post will remain vacant. Duff formerly vice president of Pontiac Air Inc., joined General on Jan. 9, 1952.

Continental Charter fatal crash at Little Valley, N. Y., last Dec. 29 was probably caused by the captain's poor judgment in attempting a flight in bad weather during intricate weather conditions. CAB made an accident investigation report.

Aircraft engine and prop. backlog totaled \$12,123 million at Dec. 31, 1951. This is a 9% increase in Sept. 30 and a 141% hike over orders on hand at the end of 1950. Complete aircraft and parts orders represented 65% of the Dec. 31, 1951, backlog.

Deane YB-51 has been ordered as a test aircraft for Army Field Forces. The YB-51 is the military version of the L-5C, can take on or short haul.

Shipment of 166 personnel and spare tire planes (2-10 planes) was made in two lots in January, with \$1,073,000 total value manufacturer's sale billing price.

Samuel B. Wilco, 77, inventor of the Wilco Teacup Landing Flare, died in St. Petersburg, Fla. Mar. 12.

Hiller Helicopters has been granted Production Certificate 607 by CAA permitting the firm to manufacture its own craft. In May issue of the last Coverd are Hiller EH-1, UH-12A and UH-12B.

United Air Lines first crash at Oakland last Aug. 24 was probably caused by failure of the captain to adhere

to instrument procedures on the approach to the Oakland Municipal Airport, according to CAA accident report.

### FINANCIAL

Lock Inc. reports net earnings, after taxes, of \$601,643 on sales of \$1,000 million for the year ended Dec. 31, 1951. Earnings before taxes were \$1.7 million. Working as of Mar. 1 was \$41.9 million.

Bendix Aviation Corp. had sales of \$341 million for the year ended Sept. 30, 1951. Earnings were \$13.6 million, down more than 35 million from the previous year. Total assets were over \$25 million. Aviation products sales totaled 75% of all sales.

Republic Aviation Corp., Farmingdale, N. Y., has arranged a \$10 million line of credit with Chase National Bank of New York to provide working capital for increased production.

Kaiser Aircraft Corp., Windsor Locks, Conn., had net earnings of \$26,560 for the year ended Dec. 31, 1951, on income of \$4,831,846. Kaiser's backlog is over \$25 million.

Chicago & Southern Air Lines had operating revenues of \$66,216,930 in 1951, with net income after taxes being \$1,136,939.

United Air Lines reports net income after taxes for 1951 as \$8,551,087, highest in UAL's history. Taxes went over \$11 million. Operating revenues reached a new high, \$1,779,794.

Continental Air Lines had net income of \$553,546 (after taxes) for 1951 on total operating revenues of \$5,878,974 for year ended Dec. 31, 1951.

Irons Aeronautical Corp. reports gross revenues of \$6 million for first quarter of fiscal 1952, ended Jan. 31, with sales volume 61% above that for same period last year.

Solar Aircraft Co., San Diego, has filed with Securities and Exchange Commission its plan to raise 120,000 shares of common stock. The company had 456,516 shares outstanding on Jan. 31.

### INTERNATIONAL

Air Chief Marshal L. S. Broadbent, 55, former Canadian Chief of Air Staff and commander of the RCAN during World War II, died Mar. 10. He learned to fly at Dayton, Ohio, in 1915.

## Consult your 1952 I.A.S. "Aeronautical Engineering Catalog"

for complete information  
on AIRCRAFTS

ROTORs — LINCOLN — ROTORAC  
& TRIM-TRON ELECTRO-MECHANICAL  
ACTUATORS Also AIRSOLAR RIGHT-  
ANGLE BEVEL GEAR UNITS



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ness in defense buildup is reflected by the increase from \$37.7 in 1950 within a year of the beginning of the postwar national program that is being utilized for security programs.

"Deliveries of weapons and equipment to the armed forces in December 1950, for example, at the rate of nearly 52 items a month," Lorch said. "The amount for the entire year at the beginning of the Korean conflict."

The schedule for 1952 will be worth checking the 1951 year-end figures into with satisfaction, due to increases 17% and 18% of the national output in 1951 will be devoted to security.

• **Defense Means**—During the last two years, Congress has authorized \$300 billion in new obligations for defense—\$492 billion for 1951 and \$514 billion for fiscal year 1952 ("Of this amount," Lorch said, "578 billion has been obligated by the year 1951 and the remainder, \$536 billion, is being obligated by the year 1952.")

As the defense program grows, it is expected that the defense will be the largest of the fiscal year in June 1952.

About 50% of the current budget of \$594 billion is to be used for more procurement and production 24% for operation and maintenance of activities and equipment, 17% for military personnel, 10% for research and development, 5% for miscellaneous military activities.

The problems of building an adequate defense have been complicated, Lorch said. "The shortage of man-made and facilities in the production of certain types of aircraft and tanks caused some delays during the past year."

• **Military Growth**—The "growth of certain basic arm categories is likely to be a very varied factor in military growth," he said "and to meet such problems, techniques for the analysis of requirements and the schedules of procurement have been greatly improved over what they were a year ago."

The Air Force during the six-month period covered by Lorch in his report has been struggling to meet itself across three primary areas of activity: 1. Korea 2. Its continuing the buildup toward 50 combat wings plus 15 supporting groups, 3. Deployment of USAF air strength into strategic areas in accordance with national commitments.

In a memorandum to the report Air Force Secretary Fletcher named Lorch that "the increasing demands upon our resources in management of the Korean operations has affected Air Force operations to fulfill our primary and secondary in the other two primary areas of activity."

## Hot-Rod Jets

- A design engineer looks into aviation's future.
- And he sees jet-powered executive transports.

Just around the corner for the fast-flying U. S. business executive is a sports jet-powered executive plane. Tomorrow he will be able to land and fly around the country at 600 mph in a pressurized jet executive plane, R. M. Hargan, Beech Aircraft's chief design engineer, is forecasting.

But first a few things have to be taken care of—such as jet fuel consumption and the cost of pressurization air. Then there is sufficient available pressurized equipment for small planes now that doesn't cost more than the fuel cost of the airplane itself. But this is easy.

• **Cost \$48,000**—The Beech engineer says he has qualified production in a recent paper before the Washington Section of the Institute of the Aeronautical Sciences.

Running down the various design problems of a proposed executive jet executive air transport, powered by two 1500-hp thrust jet engines, with a 400 mph top speed and 500 mi. range, he estimates that a small plane would cost about \$55,000 today in quantities that could probably be sold. But further streamlining to jet power plants will make them competitive with piston engines in the executive aircraft field as a few years he predicted.

Need for more engine output plants capable of competing with today's are likely in speed and operating conditions will bring about development of faster

executive planes with such auxiliary structural design and pressurized exhaust. • **Just 100 to 150**—Hargan expects that a plane with such characteristics as Beech's new T-36 will likely be an intermediate step between the jet and today's business executive aircraft. Among the executive planes of today in this category are included the twin Beech Model 38, the Veeva Bonanza, the Aero Commander, and executive versions of various and transport planes such as Douglas DC-3, Lockheed L-1049, B-26, B-27, B-28 and B-29.

The new Beech airplane, which has not yet flown, often eliminating future possibilities for civil passenger aircraft. However, the present USAF requirements for it as a navigation trainer and personal transport are satisfied, he said.

Model 46, as Beech calls the plane, is powered with two Pratt & Whitney R-2500 engines, similar to the powerplants of the Convair four and the Martin 404. Hargan says it will have a cruising speed equal to or slightly above today's business jets, one on one service.

Some other refinements which he cites for the Model 46 are: single engine performance with 11,000 ft. climb to take off from existing runways, single wing folded back of a 1,500 mi. and pressurization for one portable apartment up to 50,000 ft. The Model 46 is estimated to be one of the most economical, or most in higher demand, arrangement.

## Subsidy Separation

Hansa International and Foreign Case Aircraft Companies will open hearings in near future, on Senate proposed legislation for separation of subsidies from civil aid.



WELLY RUN'S FIRST PACKET

Kan-Kan-City has pushed the first C-119 out of the gate. It will be the first C-119 to be produced at Willow Run since World War II when Ford was putting B-24s together at the rate of one an hour.

The C-119, costing of a half-million dollars, is the first C-119 to be produced at Willow Run since World War II when Ford was putting B-24s together at the rate of one an hour.

## ATA Pushes Study Of Airborne Radar

The first joint airline action toward possible future use of airborne radar to assist in adverse conditions and to use already has been launched by the Air Transport Association, an American Airlines official has told Aviation Week/ATA, according to M. G. Board, chief engineer for ATA, has notified manufacturers of current aircraft interest in such a device and a setting up a joint industry study group to discuss what is being done in such a device.

Meanwhile, ATA is planning a study committee covering radar operation that will be held in the near future. The committee will be made up of representatives of the airlines, the FAA, and the military. The committee will be made up of representatives of the airlines, the FAA, and the military.

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American Airlines has asked the FAA for its first in 1951-52, but the FAA has not yet decided whether to approve the request. The FAA has not yet decided whether to approve the request.

Airline flight tests of prototype radar systems are being conducted in order to prove that reliability, and provide a basis for the development of a radar system.

## Secret Weapon

Has Great Britain's new jet engine, the first of its kind, been developed by the British Aircraft Corporation (BAC) in the United Kingdom.

A British aircraft company, the first of its kind, has been developed by the British Aircraft Corporation (BAC) in the United Kingdom.

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## Fare Fight

- Trunks ask higher rate to insure fair return.
- But CAB says return is pretty fair now.

Despite the Civil Aeronautics Board's recent endorsement of a policy to reduce air fares, even major domestic airlines have made an effort to maintain their rates. The CAB has said that it is not its policy to reduce rates, but it is its policy to maintain rates.

And although the CAB has said that it is not its policy to reduce rates, it is its policy to maintain rates. The CAB has said that it is not its policy to reduce rates, but it is its policy to maintain rates.

The CAB's attitude is to wait and see if the airlines can prove that rates are going to fall. The CAB has said that it is not its policy to reduce rates, but it is its policy to maintain rates.

What new form of the integrated CAB transportation, this group is a selective new air transport. That is a change that American Airlines has advocated for some time. That is a change that American Airlines has advocated for some time.

Other airlines, including TWA and Mid-Continent, have also been asked to provide data on their fares and other operating costs. The CAB has said that it is not its policy to reduce rates, but it is its policy to maintain rates.

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# Curtiss-Wright Faces a Busy Year

Company appears ready to open large-scale production attack on \$1,025-million backlog of orders.

By William Kruger

Most evidence that the aircraft industry has nearly completed its preliminary stage and is entering a period of large production is furnished by the annual report of Curtiss-Wright Corp.

Segments of C-W's engine division in January of this year were running 90% ahead of the same month a year ago, for the engine company, segments were 75% ahead of the 1951 period.

To attain that point, C-W, in that other large companies, went through a year of tremendous investment in new facilities, increased sales, increasing its customer and backlog, and greater taxes that did not increase before that of 1951.

During 1951 C-W added slightly more than \$10 million worth of back and mortar to its establishment—593,000 sq. ft. to its jet engine plant at Wood-Ridge, Calif., and C-W's N. F. 200,000 sq. ft. for a new aircraft engine plant at Gardiner, N. J.—151,000 sq. ft. for its metal processing division at Buffalo, N. Y.

C-W revenue for the year ending Dec. 31, 1951 was \$177,877,021, and income before taxes \$14,978,216. For

the preceding year, revenue was \$146,604,612 and income before taxes was \$13,618,544. But taxes in 1951 were \$6,152,000, against \$5,959,000 in 1951, pulling net income for 1951 down to \$8,800,216 compared to \$7,770,244 in 1950.

The company's backlog was steadily throughout the year and was still standing at the end of the reporting period. C-W entered 1951 with a backlog of \$100,400,000. At the end of the year it stood at \$153,000,000 and by the end of February this year was \$202,400,000. Including letters of intent, C-W's current unfilled orders total \$1,025,000,000.

Working up to a major assault on first backlog, C-W during the year sold up its backlog in excess of \$95 million (compared with \$23,618,544 in 1950), portable order in payments by the government of over \$10 million.

Highlights of C-W activity:

- **Steel center section for jet engines produced by the aircraft processing division, is ordered by the U.S. for its first, from about \$4,000 to \$4,700 for a similar aircraft engine. Steel section weighs six tons but increases per tonnage.**

- **Turbo-Gas engines completed 150 by type test at 1,500 hp.**
- **Extraordinary propeller blades are in the production stage. Extrusion will be made in a 12,000-ton press to be assembled by the Air Force at the main processing plant in Buffalo.**
- **First Turboelectric propeller for Douglas C-124B transport transport was tested and delivered.**
- **First J65 jet engine was produced and put on test.**

## NYA Wins

- **Board upholds award of helicopter certificate.**
- **New N. Y. Airways can start—when it gets craft.**

New York Airways seems to have won the final round in its long, sometimes fight with Metropolitan Air Conditioning. Within a year it hopes to bring scheduled helicopter service to the nation's largest metropolitan community.

New NYA is ready to start setting up its airline from coast-to-coast personal, routing, space, and some of the best of the helicopter helicopter.

Airco, Navy and Marine use they can't get enough engines now or for some time to come. Copier production schedules are taxed up tight for a year in advance.

- **Support in flight—For New York Airways counts on state military support and greater backing from state facilities for the construction that will scheduled civil copier operations give the military valuable aerial reconnaissance and economic data—worth more money in the long run. NYA, therefore hopes to get a small-scale operation going in New York state this year.**

And the Air Conditioning Council, consisting of military as well as civil agency representatives, has stated that acquisition of scheduled civil copiers will contribute to national defense.

The first year of copier operation, NYA will give only mail and cargo service to the transportation area, but will shortly passengers over the water airport triangle of LaGuardia Island New York. After the first year of scheduled service NYA can introduce passenger service among the suburbs and to diversify.

Marketplace transportation of each route service is subject to CAA safety air regulation.

• **Tech-Tutor Background—Through out most of last year the Civil Aero member Board seemed well-lit, giving the decision that to NYA, then**

to MAC, and back again. On Dec. 1 the Board gave the New York first choice to New York Airways. But the certificate was contingent on the company's raising the last \$100,000 to bring its minimum start capitalization to \$1,100,000.

Metropolitan first filed a contract person for recommendation, then it came up with a completely new proposal. Robertson Airline, local service line in New York and New Jersey, would buy out MAC if the Board would then grant the New York first choice. That combination aimed at NYA, Robinson and MAC cited the fact that in metropolitan copier service is not conflict with the local-based line, why not grant the Metropolitan franchise in a local service line and avoid inevitable conflict?

Although this was a somewhat new approach to the situation, the Board apparently accepted it, but it did not reverse the rule running in favor of NYA.

On Jan. 3 New York Airways handed the Board affidavits showing it had the required \$1.1 million in cash and bonds and was ready for business. It took CAA until mid-March to come out with the final ruling for New York Airways.

President of the company is John I. Rodan. Its corporate address is 131 Madison Ave., New York 17, N. Y.

## New Indictments in AF Irregularities

Defense-Two were named in indictment charging irregularities connected in connection with Air Force procurements will be assigned in the U.S. district court here Mar. 15. Decried with are:

- **Robert G. Hallfield, Jr., doctor and chief of the Aero Medical Laboratory, at Wright Air Development Center, Wright-Patterson AFB.**
- **William J. Opper, Chicago officer.**

The indictments include four counts of bribery and one of conspiracy for each of the two. They are free on bond, \$10,000 for Hallfield and \$2,000 for Opper.

Opper also charged in the indictment made acceptance of \$1,600 in cash by Hallfield during the interval from Mar. 1, 1948, until Aug. 3, 1951, during which time Opper received six contracts for jet engines and jet propellers. The indictment charged that payments were made both in Dayton and Chicago.

Part of the overt acts listed in the indictment allege that Hallfield recommended purchase of Opper's stock despite protests of another in-

vestor, that the glasses and goggles did not fit Air Force requirements. Hallfield previously had been found to accept payment in cash for the purchase of which he is the boss of the Department of Interior.

This is the second court action in solving an Air Force employee and a contractor. Judge William K. Nease recently sentenced an Air Force inspector to 18 months and a contractor to three years in a federal penitentiary following these convictions on a bribery charge.

## New Intercept

- **AAA building system for own USAF, Navy planes.**
- **First time one company does whole job.**

A new automatic intercept system developed by North American Aviation and compatible to the Hughes Aircraft 1951 intercept system has been ordered in both the Navy and the USAF.

This system NAA is a single contractor in the first general intercept system field. It is believed that both Navy and Air Force equipment will be certified in NAA-built craft for evaluation tests. (NAA is currently taking up for production of the Navy F-12, a center section of the F-104 Super.)

Significance—Development of North American's entry in the new field is noteworthy for many reasons.

• **It is the first time that as Air Force and its weapons system have been in general "under one roof." The nature of this approach to solving intercept problems is integration. Personnel will be closely matched to the industry.**

• **It is the first complete intercept system contract which NAA has let. Previously NAA had purchased intercept radar, computers, and intercept weapons. GM/Inco Navy radar, computer, and intercept equipment therefore have a big stake in the success or failure of this new industry approach.**

• **It is USAF's first attempt to place some of its intercept weapons system into a single contract. Hughes Aircraft has been USAF's sole supplier.**

• **It is evidence of growing inter-branch cooperation in procuring weapons equipment. The Navy uses AF-developed communications and intercept radio equipment. The Air Force is currently using a Navy-developed intercept intercept radar with great success in Korea.**

• **Eliminating Tubes—Little is known about North American's intercept system, although it is used to intercept a set of magnetic supplies in place of vacuum tubes. This feature would make it extremely attractive to both services because of available purchase with vacuum tubes.**

North American reportedly could not the initial system track and is developed with its own funds until the equipment was sufficiently advanced to demonstrate its ability which attracted industry support for the program.

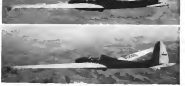


SABRES GET ALL-WEATHER EQUIPMENT

Typical the production components of modern jet fighters: the new Sabre made North America's new night fighter at Los Angeles International Airport there is built at F-100D off weather fighters partly designed for maintenance and clearing of their complex and great and often violent

equipment. Also equipment is installed, planes are flight tested prior to delivery to USAF. These in increased test testing after detailed for more to wing planning. The two 200,000 lb. engines have over 100,000 hours to permit work outside even during last weather.

• **Tech-Tutor Background—Through out most of last year the Civil Aero member Board seemed well-lit, giving the decision that to NYA, then**



NOW YOU SEE IT—NOW YOU DON'T

Intercepting out of flight strikes close range. First 1950s intercept system will be about 12,000 ft. Top speed will power at 30 mph at 1,000 ft. Best low riding speed is 3,250 ft. at 45 mph. Spins at 54 ft

bottoms. Throughout altitude used for new intercept system will be about 12,000 ft. Top speed will power at 30 mph at 1,000 ft. Best low riding speed is 3,250 ft. at 45 mph. Spins at 54 ft

## Martin Illustrates Aviation Risks

With a backlog of over \$400 million—\$350 million of it military—company is still not assured of profits.

Long, backlog, unassuming as they may be, are in themselves no guarantee of profitable operations for aircraft companies. This is amply demonstrated by the experience of the Glenn L. Martin Co., whose annual report has just been released.

For the year ended Dec. 31, 1951, a net loss of \$12,176,614 was reported—the largest in the company's history, exceeding the previous peak loss of \$16.3 million, which was established in 1947.

■ **Commercial Loss**—The chief cause of the large deficit was commercial production—some \$12 million net loss but less than this amount, represented by the 4-64 contract. Another \$1 million was lost in 1951 on military aircraft subcontracts. This latter development should drop any losses that government aircraft contracts may have there a definite profit account. A real risk, always present and the Martin case demonstrates that aviation has losses from the aircraft companies.

The Martin annual report is noteworthy in its approach in detailing the events of last year and revealing its own past position. Signed by the company's new president, who assumed office only a few days earlier, the report outlines background developments responsible for the Martin losses and the steps contemplated to resolve the present dilemma.

Reference is made to the 1950 annual report which stated, "The amounts of the subcontracting, commercial aircraft and miscellaneous other work, orders obtained during the last six months did not present important uncertainties profit within themselves."

It is clear that much of this work was assumed to provide continuing employment and to maintain an adequate minimum skilled working force in as to more a manufacturing facility in being.

However, events began beyond the control of the company took hold and resulted in sharply increased costs which "deflated working order" the firm these which had been projected. The future debt included rising material costs and wage rates.

The net losses of more than \$12 million for 1951 are estimated to have the difference between selling price and cost of production on the commercial

orders and certain subcontracts which are scheduled for completion before the end of 1952.

A footnote added to the balance sheet calls attention to the fact that about \$3 million in general and administrative expenses are included in the operating account at Dec. 31, 1951. While this is a common practice among many aircraft companies, it is not the usual conservative accounting treatment. Until delivery of all contracts on which servicing such accounts is completed, there is no certainty that further write-downs will not be necessary.

■ **Book Equity Loss**—An interesting comment in the Martin picture is revealed by the almost complete disappearance of the company's book equity position. At the end of 1946, Martin showed a net capital equity of more than \$55.5 million or better than \$40.50 per share. The series of deficits in 1947 and 1948 totaling more than \$30 million and resulting, primarily from the costly 2-0-2 venture together with the 1951 deficit have combined to leave an utterly depleted equity position.

At Dec. 31, 1951, net worth was reduced to \$664,132 or less than 50 cents a share. This is the lowest for this company in more than twenty years. Even at the 1935 year-end, net worth of \$501,000 was larger than the present position.

The almost complete disappearance of the company's net worth position is significant from a number of aspects. It demonstrates that in the absence of sustained profitable operations it does not take much of a reversal to wipe out years of accumulated effort in building up an equity. Moreover, a serious question is also raised as to using net worth in measuring profitability in the aircraft industry.

The company calls attention to a tax credit of not less than \$40 million which if not applied against book or cash for its purpose in the four years, 1945 through 1950, and possibly thereafter. However, there is no assurance that profitable operations will come to help offset this tax credit.

The Martin backlog now totals over \$400 million, of which \$150 million is military business. The management expects the receipt of additional defense

contracts. Profit margins on government contracts are generally low. If they become a question of low margins, the company can produce in the years to come.

Management is hopeful that with its backlog and its credit, considerable improvement will come in its financial condition.

■ **Refunding Plan**—A major refunding is now in effect for the Martin company. The chief elements include the following:

• Additional \$1 million from \$70 million to \$27.5 million and extension of the maturity from July 1, 1952 to July 1, 1955. (Notes payable amounted to \$12,871,425 at Dec. 31, 1951.)

• Anticipation of new loans from the Reconstruction Finance Corp. under the Defense Production Act of 1950 in the aggregate amount of \$12 million and extension of respective maturities of existing RFC contracts from five to July 1, 1953 to July 1, 1954. (Notes payable to the RFC amounted to \$84,102,990 at the 1951 year-end.)

• Eastern Air Lines and TWA line has agreed to modify their purchase contracts on the 4-64 by granting a price increase of \$75,000 per plane. (This would result in an additional \$7,125,000 for the 101 planes already ordered.)

• Additional capital will be provided through a proposed underwriting of 50 million in convertible subordinated notes and secured stock purchase contracts for 100,000 shares of stock. The notes would be convertible at \$6 per share. The complete conversion would double the existing common stock now outstanding.

As an offset to the debt and note increase, the company will be allowed rights to subscribe to an equal number of shares now held at the rate of 50 per share. The notes will be redeemed without premium for the first seven years in the event of funds provided through the stock subscription route. (Glenn L. Martin, chairman, who owns 255,700 shares or approximately 25% of the total outstanding, has agreed to subscribe to 127,850 shares.)

• An additional 200,000 shares of common stock will be reserved for the granting of options to key officials.

It is also shown that the existing common shareholders will suffer tremendous dilution of their equity. Moreover a current debt reduction program will have to be completed before any return on the capital can be realized from the flow of cash disbursements to the stockholders.

The financial case history of the Glenn L. Martin Co. clearly demonstrates that the aircraft industry, despite substantial government contracts, is so in a state of self-destruction.

—Solly Alshuler



Hamilton Standard's long experience as the leader in propeller design and production is also devoted to supplying other equipment for such outstanding airplanes as the Chance Vought F4U-C "Corsair", jet fighters for the Navy.

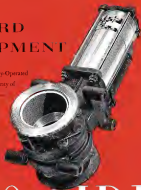
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## STANDARD EQUIPMENT

This Hydro-Aire Pneumatically-Operated Hot Air Shut-Off Valve is used by a majority of America's jet engine manufacturers. Thousands of variations are also employed as shut-offs for turbine-driven accessories, anti-icing units and heating systems. It is another example of Hydro-Aire Engineered Products which are Standard Equipment on America's leading airplanes.



## AERONAUTICAL ENGINEERING



BRISTOL BRITANNIA, shown here in artist's conception with BOAC markings, is scheduled for long-range routes by 1954.

### Bristol Britannia Nears Final Assembly

- Huge transport slated to fly this summer.
- Full-scale mockup speeds engineering tests.

By David A. Anderson

The Bristol Britannia, long-range transport prototype now in production for British Overseas Airways Corp., has reached the stage of prototype final assembly.

New pictures of the craft in the gigantic assembly hall at Bristol's Filton plant show the main wing structure attached to the fuselage. Although this is only the first step in the long assembly process, it immediately sets the surface up for fitting all the other components. From here on in, assembly should be fairly rapid.

And it's going to have to be rapid to meet the scheduled first flight date of summer, 1952.

On October-BOAC has ordered 25 Britannias, to be powered with Bristol's Proteus turbo-prop engine. The planes are scheduled to serve trunk routes to



EARLY STAGE of final assembly shows the first prototype Britannia with wings attached and fuselage skinning completed. Next stage will be engine installation.

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PROTOTYPE BRITANNIA No. 1 and 2 show the great amount built at Bristol. First prototype is being used to establish to be a success, 1952.



CLIMBING PROTOTYPE, first covered to machine contained climbing flight, is being used in one phase of complicated tests of Britannia fuel system.

Anglo and South Africa starting in 1952 or 1953.

The development prototype aircraft has also been ordered for the Ministry of Supply, and it is the first of this sort in due to be this year.

In addition to these 27 complete aircraft, Bristol is building:

- A full-scale mockup, for functional tests of engineering or production principles.
- A full-scale wing, complete with ailerons and partial fuselage, for stress tests.
- A full-scale fuselage, also fitted for structural tests.
- A forward fuselage 50 ft. long, for pressurization tests.
- Sectional control surfaces fitted to a Bristol Freighter for flight tests for comparison with results of wind-tunnel tests.
- Comparison—Newest American gas engine counterpart of the Britannia would be the Boeing Stratojet. Britannia has a 1400-hp engine and carries 2000 lb. of fuel. Available data and a first-hand report on the plane

was given in Aviation Week, Nov. 5, 1951, p. 242.

Engine on the Protos 2 turbo-prop, but English sources have indicated that the Britannia will be powered with these engines, but that the Protos 1 will be the production concept. General aviation report for the Protos 2 is 1,300 hp, from each engine.

Total fuel capacity is given as 5,750 U. S. gal. It is loaded in 14 big cells, seven on each panel.

Seating capacity varies from 50 to 100, depending on the customer's wishes. One particular improvement could carry 50 passengers and luggage, carrying between London and New York during 50% of the existing weather conditions. It could share that with the New York London line.

Functional Mockup—Bristol's full-scale mockup is the largest contraption of standard practice in the aircraft industry. All construction made made up of all or part of that aircraft. Some of these are quite simple, and are used in wind-tunnel, others are quite complex and are used. But it's the ground be-

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## Ever see a helicopter grit its teeth?

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WILMINGTON, PA  
STRATFORD, CONN



When a helicopter's gear blades spin, they two-inch gears must carry the load. For teeth with a perfect bite, Bell Aircraft chose Lycoming's precision production.

But Bell Aircraft has built the first fast-track mockup for a civil aircraft.

In developing the mockup, Bristol used parts which were the first two from production tooling; such parts are usually scrapped. In general, prototype metal fixtures have been maintained, although sub-standard materials were used.

For simplification—and because a certain degree of looseness would be permitted in a new flying airplane—Bristol altered a lot in the details. Inspection of parts was not so rigid, and such matters as flush rivets were eliminated by caulked joints.

The mockup includes the fuselage, back seat to the wing mounting ribs. The left wing is complete with nacelle, and extends to the left aileron. The right wing includes only the aileron nacelle. Complete landing gear—mainwheel and nosewheel—is included, and so are the right wing flap. The cockpit has flight controls in place; flap trimmer, the control system ran as far as permitted by the completeness of the mockup. At their ends, these systems can be connected to devices for simulating actual surface loads.

What Good?—This new flying aircraft serves as an accurate three-dimensional check of installation layout. Bristol says that the accuracy of checking is much greater with a metal mockup than with the standard wooden one. (Initially, Bristol also built a wooden mockup for more conventional and approximate procedures.)

It is also possible to check complete systems on this mockup, a feature not generally done with wooden models.

Scrivings and maintenance procedures can be determined and checked and corrected here before the craft gets out into service. The saving here is obvious.

And in addition, Bristol says that the mockup will eventually be convertible into a full-scale case tester.

It would also seem that such an accurate mockup would serve as the first step in proving ground for changes and modifications for later models of the Blatant 35. For example, the Bristol people were to follow American practice in their partly place by design and conduct a check of fuselage, the nacelle would be the logical place to start developing such a change.

Bristol built their system which can be tested on the functional mockup engine and flight controls fuel, hydraulic and electrical systems, air conditioning, fire prevention, emergency and other equipment.

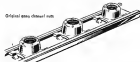
► Fuel System Tests—First tests made with the mockup engine on the mockup were complete disclosure of the fuel system. Another rig, normally used for testing the fuel system between tanks

Advertisement

## Fastener Problem of the Month

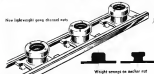
Modern Demands for Weight Saving

March 1952



Original steel channel nut

**PROBLEM:** In every phase in the construction of today's high speed aircraft, designers are looking for weight savings. So, here at ESKA, it was felt that a nut which saved weight without sacrificing strength would be an important consideration—adding a further advantage to the assembly time savings offered to the aircraft industry by the original vibration-proof wing channel nut strip design.



New lightweight alloy channel nut

Weight savings in section cut

**SOLUTION:** ESKA engineers designed this new aluminum assembly, offering strength

Weight savings in wing channel nut used in the previous design, while reducing weight by 30%. The new nut is supplied assembled in a 2 1/2 x 4 high strength aluminum alloy channel, also machined for ready identification. And like all ESKA Wing Straps, the returned nut locking collar assures a vibration-proof grip on the bolt threads, protection against corrosion, a constant self-tightening torque that makes uniform bolt loading easy... and reasonably. A weight-saving of 30% was accomplished in a vibration-proof member cut. Both new nuts conform to all requirements of ASTM.

**TOUR FASTENING PROBLEM:** ESKA has a standard ESKA solution. If not, ESKA engineers may suggest special fasteners.

**Buy: H15-255: Elastic Strip Nut Corporation of America 2218 Wyndham Road, Greer, N. C.**

FOR INFORMATION AND QUOTES FOR THE NEW STRIP NUTS AND COLLARS, WRITE TO THE NEW STRIP NUT COMPANY, 2218 WYNDHAM ROAD, GREER, N. C.

Please send me the following information on ESKA self-locking fasteners.

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☐ If it is a drawing of my product, will you include technical data on it?

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AVIATION WEEK, March 24, 1952

# LEWIS

## Standard Temperature Indicators for Aircraft

USED BY LEADING AIR LINES, THESE INDICATORS HAVE PROVEN THEIR RELIABILITY BY YEARS OF SATISFACTORY SERVICE

### THERMOCOUPLE TYPE

All LEWIS thermocouple indicators are fully cold-weld compensated, automatically checked and are available for use with iron-constantan, copper-constantan or chromel-alumel thermocouples in all standard ranges for the thermocouple material used. A few typical ranges are listed below.

MODEL 151, 2½" case to AMO 10401  
-50 to +300°C Cylinder Temp.  
(AN 823-14 or TIA)  
-50 to +300°C Barrels Temp.  
0 to +1800°C Exhaust Temp.

MODEL 152, 1½" case to AMO 10402  
-50 to +300°C Cylinder Temp.  
0 to +1000°C Exhaust Temp.

MODEL 154 dual, 2½" case to AMO 10403  
-50 to +300°C Cylinder Temp.  
(AN 823-14 or TIA)  
-50 to 300°C Bearing Temp.  
0 to +1000°C Exhaust Temp.

### RESISTANCE TYPE

Accurate resistance-type, these LEWIS indicators are measurably free of hysteresis error, have nearly linear scales (not crowded at the ends) and are expertly shielded. A few typical ranges are given below. Not shown is Model 45R, 3½" single.

MODEL 47L, 1½" case to AMO 10402  
-50 to +130°C AM 570-4 or AM 570T5  
0 to +120°C Oil Temp.  
-50 to +150°C Air Temp.

MODEL 77L dual, 2½" case to AMO 10403  
-50 to +130°C AM 570-4 or AM 570T5  
-50 to +220°F Oil Temp.  
-100 to +350°C Cylinder Temp.

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HAUBATUCK, CONNECTICUT

Manufacturers of Complete Temperature Measuring Systems for Air Craft



MODEL 151



MODEL 152



MODEL 154



MODEL 154



MODEL 47L



MODEL 77L

and engine-oil-air pumps, were used in the early days. Because the engine was not isolated, the engine oil was actually used to supply fuel under pressure.

In most of the cases, only 10% of the fuel was used, the supply which would normally go to the engine was returned to the tank.

The rocket can be tilted to attitudes which could be obtained in actual flight. The fuel system tests were made for rocket angles of 15-deg climb and 3-deg, dive, in combination with 5-deg side-slip both left and right.

There were two phases to the system tests. Flares were measured for gravity feed and were repeated for booster pumps on. The tests were again repeated with the booster valves open and even tanks were checked.

The test flow rate was 400 gph per engine, which represents 125% of the maximum fuel flow of 336 gph per engine.

Although the fuel system tests were completed, fuel system will not be obtained until flight tests which will show whether the atmospheric test is correctly verified.

Pressure Relieving—The batteries can be pressure relieved, and tests of the system were also made on the micropump. A safety valve in each cell allows air to escape pressure. The legs are located between the main pump and operation of the cell would produce what should be called "negative results."

Test on the batteries can be either continued or interrupted. The meter is connected to the meter side of the main tank side. It is accurate and power-operated. The functional micropump made it possible to check the system, but only flight tests can give the final answer. After silencing, about 500 and, actually to the tank.

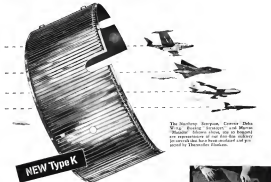
If a battery is changed in flight, the meter is necessary to reload the gas, the pressure relieving system are used. For maximum flow, the booster pumps are switched on, otherwise, gravity feed. With booster pumps on the fuel is flowing rate was 2,300 gph.

By means of "negative" design, the fuel is not used to get the quantity of unburned fuel down to less than one gallon for the whole system.

Spur Program—In addition to the tangible results in the booster tests, there has shown some new reference data on the batteries.

The batteries have a "negative" value of 4,000 ton miles per hour; this is the total potential capacity of the system. Actually, if one uses the quoted product of 2,300 gph, and the quoted weight of 300 gph, the overall index means out to be 4,920 ton miles per hour, using the 2,300 gph ton. With the British long ton of 2,250 lb, the

On the latest Air Force and Navy aircraft...



## NEW Type K THERMOFLEX BLANKETS

### insulate against searing heat of jet engines

Just as the Air Force and Navy demand speed and maneuverability in their latest jet aircraft... they also demand safety leaves such as is provided by the Thermoflex Blankets. These man-made blankets insulate and protect high power plants and aircraft against the searing heat of jet engines.

To keep pace with fast changing requirements, Johns-Manville has recently developed a new engineering blanket for Thermoflex Blankets. It is an "improved" construction known as Type K.

By reversing the former standard Thermoflex Blanket construction and placing the unusual foil on the inside and the ground foil on the outside... the new Type K Blanket expands around the engine without causing the pipe to flex as the diameter of the hot pipe

expands, even, or otherwise expands with high temperatures.

Another major improvement in Thermoflex Blankets—made necessary by the constant use of aluminum in jet engine casings—is the new Thermoflex NF foil. This lighter weight blanket insulation film is made from aluminum, instead of copper, and has a very high thermal conductivity at the high temperatures encountered in jet propulsion.

Thermoflex Blankets are also available in special precast shapes of turbine, piston, and integral internal engine parts, bearing systems, firing ducts, fuel storage tanks, and many other high temperature areas.

For further information, send for your copy of Brochure JM 1358. Address: Johns-Manville, Box 60, N.Y. 16, N.Y. In Canada, 150 Bay St., Toronto, Ontario.



Side of blanket makes refractory metal air duct more lighter Thermoflex Blanket insulation film has improved safety at high temperatures. New in blanketing.



Close-up view of new Type K Thermoflex Blanket construction with ground foil on outside, instead of on inside. The ground foil provides expansion of entire blanket without creating excessive stress.



**Johns-Manville**

PRODUCTS for the AVIATION INDUSTRY

## New Over-Heat Detector For Super Jets



**ENHANCEMENTS IN JET PLANE DESIGN** demands more and more ingenuity on all parts of the aircraft designer. For this reason the introduction of a right angle mount over-heat detector for Fenwal's super jets is a welcome contribution. Its internal principle of a right angle from the mounting plate thus making it suitable for confined spaces.



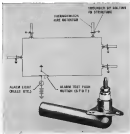
**IN THE FENWAL INSTALLATIONS LABORATORY**, Fenwal engineers determine which alloy metals best meet the requirements of specific design needs. The laboratory is one of several which help standardize high quality standards in Fenwal's plants. Other types of Fenwal's aircraft THERMOSWITCHES can now be used for heater control, safety zone heat control, fuel flow control, and engine control, air flow heaters, cabin temperature control, fuel flow, etc.



### THERMOSWITCH®

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**FENWAL'S RIGHT ANGLE MOUNT OVER-HEAT DETECTOR** permits easier assembly and removal of wires and terminal connections than the design being modified. Since a single wire must be moved across. Each detector can detect operation independently. A double break only eliminates detection between terminals. Each feature checks safety zone.



**THE PROBE** IS THE TEMPERATURE-SENSITIVE ELEMENT. Fenwal detectors function the fastest responding air temperature monitor the design great. Its long, thin probe allows control, hermetically sealed, highly resistant to shock, vibration, and extreme temperature variations. For complete data on the new right angle mount detector, as well as other Fenwal aircraft standards, write Fenwal, Incorporated, 175 Pleasant Street, Detroit, Mich.

current modes is about 4,000 miles (miles per hour).

Good weight of the airplane is 140,000 lb. (up 10,000 lb. from the figure quoted last fall), payload remains at 13,500 lb. Armed with these figures are a variety range of 4,000 static miles at a cruising speed of 500 mph and a mass altitude of 30,000 ft. Maximum 400-mph range with standard tonnage is 3,600 static miles with a payload of 12,000 lb.

The B-57 can climb a 90-ft altitude in 3,700 ft. flying out against a 5 mph wind. At a positive altitude of 4,500 ft., the distance increases to 6,000 ft. at an altitude temperature of 300°. Sea-level landing performance requires a distance of 2,000 ft. clearing a 50-ft. obstacle in a 5 mph wind.

Typical loading for the B-57: 70 passengers with 60 lb. of baggage each, 400 lb. of food and 11,500 lb. of fuel on flight, for a 25,000 lb. total.

## THRUST & DRAG

This tricky little push-pull known as "thrust" is a stable aid for humans on airplanes and guided missiles. It's a somewhat V-2 type of rocket, 15 in. long and 2 in. in diameter. It's powered by heating oil burners which drive two nozzles—one for propulsion and one for

to push and pull a light star in action. It pushes itself over a telescope working a light which translates the light into a wire. When it hits its target, the warhead "explodes" in a massive red spray. Aside from the educational angle, this device is one of the most striking tests on adult male cockpit. And you should have quite a struggle keeping it over from your own small boy.

Reports are that General Electric is about to test one of its two North American B-57s to Push & Pull (or White) Aircraft so that later can see it in

J-77 actual runs. The B-57 expected to be released to the Air Force for this number in one GE had been using for some time to obtain data on optimum service life of J-77 under controlled, high-altitude conditions—probably leading to accurate information relevant to future commercial jet transport operations. The other B-57, which GE will test, was recently converted from 117 for test vehicle and with complete J-77 drag from the back by a crane engine. —DWA

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Just a small flow-detector tab below the leading edge, yet this means gives you airplane better handling, flight, and maneuverability characteristics, regardless of its size or weight. It's part of the Safe Flight pre-stall instrumentation system.

Regardless of load, speed, acceleration, or flap position, this detector gives infallible pre-stall warning of a potentially fatal stall margin. It substitutes the Safe Flight control checking device which perfectly eliminates actual banking or difficult maneuvers in modern, and high-speed aircraft. Equally important, it helps the pilot obtain maximum performance by supplementing his perception skill in the region of C<sub>max</sub>.

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Grumman F4U Corsair (all models)		Cessna 441 (all models)
Boeing B-29	Cessna (all models)	McDonnell F3H Phantom II
Fine (all models)		Boeing F-105, T-38A-47 series

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TODAY AND TOMORROW



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Meering, Maxwell & Moore switches now provide maximum safety on many aircraft. They sense fuel, oil and air pressure, flush warning lights at many kinds, exhaust water and alcohol injection pumps, and perform numerous other tasks.

Flexibility of switch design permits engineering to your specific needs. All models have a highly sensitive differential pressure sensing element with a non-adjustable lamp diaphragm. Accurate operation at any pressure and no pressure within range and a maximum life of 180,000 cycles are assured. Switching is through SPDT contacts, micro-switches or relays, depending on load characteristics. Pressure differential and range are internally adjustable.

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## Test Stand Checks Pneumatic Units

A new test stand for making final control checks of pneumatic systems components on aircraft and ground service is in production at the Glendon, Calif., plant of Spence Engineering and Sales Corp.

The test stand, designated Model S-413, is a package unit in a solid steel cabinet 6 ft. wide, 3 ft. deep and 4 ft. 2 in. high. The test area can be closed off completely by sliding steel doors, 1 in. thick, and to observe the tests, a 2-in.-thick, bullet-proof glass window 20 in. square is provided. With doors closed all controls can be operated.

Three separately regulated test outlets are provided, with ranges of 0-200, 0-2,000 and 0-5,000 psi. Two flowmeters for measuring leakage have ranges of 0.01 to 0.34 cubic feet per minute and 2 to 25 cubic inches per minute.

To get maximum pressure of 6,000 psi, the customer furnishes a 2,000 psi nitrogen bottle and boasts the supply pressure with a Spence Model S-1500-WR air booster. This unit operates down shop air supply at 100 psi, and is water cooled and lubricated.

Pressure at the test stand inlet may vary downwards from standard cylinder supply pressure of 3,800 to 2,200 psi to 100 psi.

It is possible to let supply pressure drop below the 100 psi level, but then the booster efficiency is lowered proportionately.

Prices and delivery questions can be obtained from Spence Engineering and Sales Corp., 1144 W. 119th St., Glendon, Calif.



Let's check that bypass again, huh?

Boeing Plant 7401 (740001)

## EMC and CYCLOHM FRACTIONAL H.P. MOTORS

Selected and Most Compact  
1/1000 to 1/2 H.P.  
Standard Frame  
1/1000 to 1/2 H.P.  
Induction Types  
1/1000 to 1/2 H.P.



EMC and CYCLOHM fractional H.P. motors, available with or without gear units, provide a wide range of use and versatility to meet your small motor requirements.

EMC model 100 (illustrated) is specifically designed for aircraft applications rated from 1/13 to 1/100 H.P.

Check the partial list of applications below, and write for our catalog and full information. Write today!

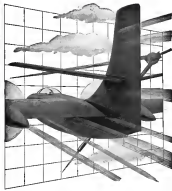
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All Distribution	Altimeter
System	Flap Motor
Control Air Systems	Radio Receiver
Control Air Systems	Door Closing Motor
Control Air Systems	and many more

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GUARDS AIRCRAFT SAFETY  
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Leading aircraft manufacturers use Bristol Automatic Precision Control Equipment on fighter planes, bombers and transports.

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WIKEN Approx. 12 1/2 lbs.

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Meets power supply requirements for AN-8-1/3 equipment.

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## Royal Navy Tests Steam Catapults

A high-performance steam catapult, designed for launching the most modern carrier aircraft at higher speeds, has been developed in the Royal Admiralty and will be demonstrated to the United States, Nov.

The new test has been tested for the past 14 months in the water around England, and further tests with U.S. equipment are scheduled. New fitted to HMS Pegasus, light fleet carrier unit of the British Navy, the catapult is slated for future installation in carriers of the Royal Navy and the Royal Australian and Canadian Navies if the present tests are successful.

■ **Race Scheme**—A slotted cylinder in the upper part of the catapult. The aircraft to be thrown off is attached to a hook which is fastened to a piston. This piston is driven through the slotted cylinder by high-pressure steam from the ship's boiler.

(The wartime German V-1 was launched by a somewhat similar device in which the steam came from the decomposition of concentrated hydrogen peroxide.)

Inventor of the catapult is a volunteer reserve officer in the Royal Navy, Commander (R) C. G. Mather, of Messrs. Brown Brothers and Co., Ltd., of Edinburgh, Scotland, who designed and built the catapult in HMS Pegasus.

In that installation, it was necessary to build a raised section on the flight deck forward of the aircraft, and to install compressors and control chain machinery on the larger deck. Naturally, such gear would be placed in various locations around the ship, and the British say that it takes up less space than the conventional types.

Steam requirements for sustained operations are considerable, but tests have shown that the demand upon the boiler can be met without interference with satisfactory operation of the ship.

■ **Aircraft Launching**—The first planned aircraft to be launched from the new catapult was a Hawker Pencil, two-seater propeller-driven plane. The Vickers Supermarine Attacker, single-seat turbo jet fighter, was the first jet job to be catapulted.

Up to now, 127 planned tests have been done off the Pegasus' bow.

In addition about 1,000 dead weights and pilotless aircraft have been launched.

And the Fleet and Sea Fury have been launched from the Pegasus when the ship was stationary in the water.

U. S. Navy tests are to be made at Philadelphia and Norfolk Navy Yards with dead weights and fittings representing service aircraft. If their tests go well, the next step will be the launching of U. S. Naval aircraft.

# Aircraft Parts by Eaton

## combine outstanding developments in design, metallurgy, and production engineering



Since pioneering the development of the sodium-cooled valve in cooperation with the Army Air Force at McCook Field in 1922, Eaton has made many important contributions to the aircraft industry in design, metallurgy, and production. Eaton's understanding of the problems peculiar to the aircraft industry has led to the development of unique, high-volume production facilities for the manufacture of parts which meet exacting aircraft standards of quality.

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Aircraft landing gear and ball-bearing screw actuators are the sole products of the plant comprising approximately six acres of specially designed brick-and-steel buildings. Equipment includes the latest in production tools, testing devices and laboratory facilities.

Starting with the manufacture of the first air-hydraulic landing gear 25 years ago, plant capacity has steadily increased—last year about 35%.

Even more important than the physical facilities is the leadership of Cleveland Pneumatic landing gear in our large staff of experienced engineers. Follow our ads for more information regarding the Cleveland Pneumatic story.

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NEW IMPROVED WING

SMALLER and lighter avionics units, like color integrable diodes, a must.

## IRE Talks Point To Weight Saving

New ideas on smaller electronic units, simplified maintenance described; tiny transistors shown.

By Philip Klaus

New techniques and ideas for reducing the weight and complexity of avionics equipment, increasing its reliability, simplifying internal fault isolation, and for applying the new wonder transistors to electronics equipment were discussed at the recent annual convention of the Institute of Radio Engineers in New York City. More than 25,000 engineers and electronics specialists at

attended the four day session.

Papers of particular interest to the aviation industry indicated that:

- Flyweight, miniature, long life transistors have already begun to replace vacuum tubes in some military equipment.
- Military aircraft may soon be using a new space-saving modular type rack to mount avionics equipment, based on new case design and sizes.
- Critical improvements outside of de-



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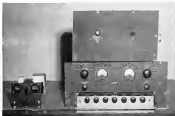
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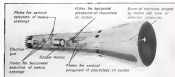
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NEW and old self-inductance converter. Minimum (left) was baseline



CATHODE ray tube can spell out words at rate of 30,000 characters per second.

tronic equipment could mean large savings in weight and complexity of electronic gear.

• Fluctuations of temperature, altitude and humidity are not as troublesome solely responsible for environmental failure of electronic equipment.

• A small increase in allowable operating temperature of various components means appreciable weight reduction in cooling equipment.

• Close integration between military, systems and aerospace organizations must begin early in an aerospace program. In other aerospace papers, new equipment is being put into service.

• Convert electrical voltage into words or words place materials on the face of a cathode ray tube at rate of 30,000 characters per second.

• Measure cloud height in 1/12 the time of existing equipment.

• Automatically determine wind direction and velocity.

• Should greatly reduce the weight and size of electronic "glorifiers."

• Quickly pinpoint the source of trouble in electronic equipment.

Among the highlights—A popular new electronic exhibit with various people was the Collins Radio demonstration of

their new Flight System (space) indicator, applied to various aircraft (space) indicator. Various model "B" the demonstration on a computer to make an ILS approach. An adaptive plotting board (computer to plot) and with a track (computer) and a computer plus some more of the flight.

Collins also displays their new light weight ARN-79 military navigation receiver for VOR and ILS facilities. Manufactured and sub-manufactured construction of the new and reduces its weight to about half that of the first model ARN-79 receiver in current use. The ARN-79 has wiring panels which can be quickly swung out in exposed horizontal position for easy access and maintenance.

Federal Telecommunications Laboratory, displayed their new Distance Measuring Equipment (DME) airborne interrogator-response which they purchased for the Civil Aeronautics Administration. The unit weighs about 57 lb.

Although, more than 100 manufacturers displayed their electronic units on four floors of Grand Central Palace.

Technical Demonstrations—Two of 16 ILS systems were displayed specifically to reduce or improve subjects. There were 10.



## QUALITY... the Most Vital Component of All!

When you have a prescription filled, you usually assume that it will be "just what the doctor ordered" ... in quality you take for granted. And you can, because your pharmacist never does. To him, quality and accuracy are virtually a sacred trust. This same feeling pervades all Eclipse-Pioneer. Long ago, Eclipse-Pioneer developed and insured a quality control system in process it has become literally the standard by which the "industry" is judged. Every part and process from raw material to finished product is tested and checked with the finest equipment and methods available today. Thus, in specifying the most experienced and conscientious for your glasses, you can be certain of the highest quality it is actually possible to deliver when you call on Eclipse-Pioneer.

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**Vlier Multi-Dimensional**

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**REAMED HOLE FIXTURE KEY**

**Reamed Hole Fixture Keys**

were developed for users who do not want to use milled fixture key-ways. These units have the same economy and positive alignment as Vlier milled slot fixture keys. Ask your nearby Vlier distributor to demonstrate their many time-saving features. Send today for Catalog No. 50.



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- Integration of electronics and airborne designs.
- Reliability of military electronic equipment.

Some of the papers in other sections were on new techniques in aerospace propulsion, new vehicles, new analysis, computers, or teleconferencing of information, subjects which find application in the aviation field.

**► Aerospace Materials: Integrations**—The new proposed type of modular aircraft component case and joint construction, contained in fifteen brochure volumes has already been adopted by the AF's research lab and is being conducted by four component laboratories, according to F. E. Winger, chief of the Component Development Division of the AF's Wright Air Development Center who described the new development. If adopted, it will mean industry-wide changes in design and layout of aircraft equipment.

Described to replace the long standard JAN-C-271 spec, the new modular case sizes will come in three widths: 12 in., 17 1/2 in. and 19 1/2 in., according to Winger. Any one depth dimension up to 5 in. is permitted, beyond 5 in., lengths can vary in 1/4 in. increments in a maximum of 30 in. One height can vary in 1/8 in. increments.

By providing the rule with isolation accounts, to eliminate their need on individual component cases, considerable "save" space between individual component cases can be saved. However isolation elements can be used on individual cases if required, including the new "centered gravity" type of mount.

The proposed new case design also accommodates cylindrical (permanent) units and will have standard quick-disconnect type electrical connectors to mate with those on the rest of each case.

**► Integration Problems—Scalable reduction in weight and complexity of aircraft equipment would be possible if voltage and frequency capabilities were increased, say to a 15% A.P. Canale said. The design and weight of nearly every piece of aviation equipment is justified because of size limitations on voltage and frequency capabilities and because of most unforgotten occasional abnormally low power supply frequency, he pointed out.**

Canale, of General Electric, said that the new incorporation of answers for new test, intercept and navigation equipment to replace those discarded after fusion between military, aerospace and defense engineers from the very inception of a new defense program.

**► Environmental Problems**—Many environmental factors of aircraft equipment are due to rapid transition between extreme combinations of temperature, humidity and altitude, and not just to the extreme themselves, according to

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Our expanded plastic that is lighter than balsa wood but of great structural strength, is being used for gun plugs for jet fighters . . . and, as a core between REPCO Panels in sandwich construction for overhead racks, floors and filler sections.

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He estimated that the complete watering system would cost about \$200,000, half of which is Federal funds and half City. All but one of the potential areas will be placed on roofs of low stations.

All areas will be activated from remote controls.

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The Convair Engineering Development Center—highlight of a vast expansion program for national defense—is now in operation at San Diego. The Center sets a new standard for "space-time-cost" integration of engineering design, research, development and introduction.

It is geared to Convair's leadership in guided missiles, electronics, atomic projects, aerospace aircraft, jet bombers and water-based planes.

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ment, men quickly to measure significant voltages and variations in the transistors, capacitors, radio circuits, or power supply. In processing several detector sections. Switch patterns are coded to show corresponding color-coded voltage ranges on the test meter which should be obtained if the circuit under test is operating properly.

Where waveforms are to be obtained on a cathode ray tube, miniature sketches of the desired waveforms are shown—apparently appropriate selector switch positions.

► **Music Problems**—It's much harder to program failures in music systems than in aircraft equipment because the music system no detector and is destroyed on impact. Capt. A. C. Finkler, head of the Navy's Air Missile Test Center at Point Mugu told his audience:

The best method devised to date to compare music equipment simulators is to subject it to ground test conditions which are far more rigorous than those which can be expected during the missile's flight. And this isn't as easy as it sounds.

Remembering flight conditions are far more than the engine output. Capt. Finkler cited one example of unexpected motor equipment failure which was finally traced to a sudden transient acceleration peak at the start of burn-out which far exceeded maximum anticipated accelerations.

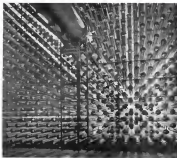
According to Finkler, test results are usually being reported ten hours or the ground prior to launching for only a 12-second flight. Failure during the ground test system neither can be traced to the test before flight.

► **New Equipment**—Vacuums have been completely replaced by transistors in the new intermediate frequency can tester for a radar klystron which the Signal Corps developed and demonstrated before the IRE. The transmitter and converter weighs only 1/2 as much as the vacuum tube version. Power consumption is down from 175 w to 165 w, allowing operation from portable batteries.

A new radar and computer system which automatically determines and prints wind speed and direction has been developed by RCA and the Signal Corps for Air Force use. Operating on a 5.75-in. wave length, the radar tracks a weather balloon carrying a radar target up to ranges of 70 mi.

Data on target altitude, elevation, and range are fed to a computer which automatically calculates wind speed and direction, printing the information at great intervals.

► **The Characterizer**—A new cathode ray tube has been developed which can convert electrical voltages into a visual presentation of alphabetical or numerical information and should prove useful for converting analog to digital computer



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► **PY-DEE Sound Absorbers** are created to effectively reduce noise from jet and reciprocating engine test cells. Each lightweight corrosion-resistant unit is being used productively with no contact between and is capable of withstanding high wind velocities. Closed aluminum coils are provided with study for separation. This system affords flexibility in spacing even after installation.

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This new instruction and service manual deals with the Cannon XL 400 Series and other Cannon Plugs having standard 10mm. Fully illustrated, with clear, concise text, it explains step by step assembly, adjusting, assembly, maintenance, operation and service procedures. If you are working with standard metal connectors this specialized manual will be of great help. It will be of little value to conventional plastic used work. Please request your free copy from the Cannon Electric Department shown below.

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**Factories in Los Angeles.** Sources: New York: Representatives to production. Article published in *Current Events/Community*. Dept. L-40, P.O. Box 70, Lincoln Heights Station, Los Angeles 10, California.



contents include

- External views
- Details of contacts
- Drawing
  - Centre change
  - Base width
  - Lateral contacts
- Wire placement
  - Drawing
  - True size
  - (Height  $\times 2$ )
- Grinding
  - Large circles
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- Assembly
  - Sealing engagement
  - Glass sealant
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  - Continuity testing
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Any message on magnetic data is inscribed out on the face of the tube helix, developed by Coaxial systems, at a rate reported to be as high as 10,000 characters per second. With its associated high-speed reading system, Coaxial can read a 1000-word permutation of data at substantially less than 1000 words to a permanent form.

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Well, if you are testing—reduce power immediately. Be sure that your cond. flap is open. Avoid pooled postmortem run up.

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They also described a means of measuring the equivalent circuit impedance. The choice of equivalent circuits and descriptive parameters should be made according to the particular application of the transducer, the IRB engineers are told by Dr. J. A. Morton of the IRB Laboratories.

These papers were presented describing the applications of transducers to load-pump, amplifier, oscillator, and pulse circuits. K. P. Moore of RCA described the use of impedance fit in detectors, or transducer circuits, he can provide fit, at its extreme the virtual loss of all transducer gain to fall off with increased frequency.

J. A. Schaffner of General Electric said that the transducer is well adapted to use in oscillator circuits except at high frequencies where the relatively long transit time of the "holes" (free electron charges) is a limiting factor. Schaffner compared the operation of a transducer to that of a vacuum tube when both are used as an oscillator because the transit time of transducer holes is in direct proportion to collector (plate) voltage.

J. H. Decker of Bell Labs stated that a single transducer may be used to replace two vacuum tubes for some types of pulse circuits. He discussed the use of the transducer in a "variable" (thermo-

resistor) pulse generator which can produce a 4 microsecond pulse with a rise time of only 0.02 microseconds.

## Unit Checks on Propeller Strains

A new method to measure the strains of stress gauges has been developed for study of propeller strains at right. The new technique was worked out by the Aircraft Research Foundation of the Illinois Institute of Technology, in a program sponsored by USAF. The technique involves applying vibration voltage in a series of pulses instead of using continuous excitation. This permits the use of higher gauge voltages.

## Transducer List Is Instrumentation Aid

Aerome, engine, and accessory transducers will find it much easier to select their best instrumentation problem in a study of a new publication, *A Compendium of Analog Transducers*, prepared by the Allen-Bradley Laboratories. The booklet is loaded with pertinent information available throughout the aviation industry. Nor is it merely a catalog—DeMott doesn't make any of the more than 500 transducers listed.

Rapid advances in aviation and engine art have forced manufacturers to go to greatly increased intensification of their experimental and prototype test frames and engines. Design engineers need a myriad of performance data to show the last minute of performance out of the design and to point the way to new and improved designs.

Such phenomena as stress, acceleration, displacement, pressure, temperature and others can usually be measured most easily, and continue to be recorded most easily, if fed converted to electrical signals. That is the function of the analog transducer—the "brain" of the instrument applied to such devices as turbine, stress gauges, thermocouples and others. But choosing the proper transducer is usually a difficult problem.

The complexity of the instruments from engineers' task is facilitated (thus aided) by the fact that the new DeMott compilation lists transducers to measure more than 60 different phenomena.

And for a particularly application, singular position for instance, 49 different transducers are listed. But because the difficulty of selecting the best transducer without such a listing.

DeMott responded the need for the compilation is a result of its complexity.

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**TOO  
FAST  
TO  
FOLLOW**



■ Socany-Vacuum research engineers studies glass burner simulating combustion in jet engine. Small-scale burners take the place of full size jet burners—enable researchers to make exact tests under operating conditions. These tests are part of the jet fuel research program Socany-Vacuum is carrying on for the Air Force.

**...SO**

Socany-Vacuum "flies" at 60,000 feet—makes steep climbs, sets distance records in its test-tube jets. The purpose: to find a jet fuel that eliminates flame-outs and foaming—lengthens flight range.

**JET FLAMES**—operating at supersonic speeds—in temperatures ranging from 500 above to 70 below—pose many fuel problems. Sometimes fuel boils away in fast climbs... flame-outs call for restarting at high altitudes. Carbon deposits may interfere with engine operation.

Socany-Vacuum is helping solve these fuel problems by duplicating flight conditions in the laboratory... measuring flame speeds of experimental fuels... exchanging information with manufacturers and designers—so that the solitary places and designers may go further, faster, on less fuel.



**PACING AIR PROGRESS SINCE HISTORY'S FIRST FLIGHT!**

# New ADEL Lightweight 3000 PSI SOLENOID, PILOT-OPERATED 4-WAY SELECTOR VALVES



New ADEL pop pet type selector valve No. 21790 Internal leakage in neutral position 1 drop per minute maximum at 3000 psi. When in neutral, cylinder lines sealed to return. Can be used as a part of separately convertible 3-way valves.  $\frac{3}{8}$  and  $\frac{1}{2}$  inch line sizes.

Weight  
2.6 lbs.

New ADEL slide type selector valve No. 21345 Internal leakage in neutral position 1 or per minute at 3000 psi. When in neutral, cylinder lines can be blocked or sealed to return. Valves available with cushion springs or detents.  $\frac{3}{8}$ ,  $\frac{1}{2}$  and  $\frac{1}{4}$  inch line sizes.

## CHARACTERISTICS OF BOTH POPPET AND SLIDE TYPE VALVES:

- No venting ends.
- Integral flange for protection of pilot valve portlines, etc.
- Continuous duty solenoid either 1 or 5.
- 4300 psi. proof pressure on all ports.
- Pressure drop 40 psi at 8 gpm, 100 psi at 1 gpm.
- Proved for 1200 valve lbs. 18 valve actuators available for other dc voltages.
- Available with or without neutral control.

New design are more compact, have low weight, longer service life, less maintenance, easy installation characteristics, ADEL's extensive engineering and manufacturing experience in Aviation Hydraulic Equipment ensures uniform excellence of products.

## ADEL

DIVISION OF BOMBA INDUSTRIES CORPORATION • BURLING, CALIF. • PHOENIX 301-10

LEADER IN  
HYDRAULICS

For complete engineering specifications and complete address: ADEL DIVISION, BOMBA INDUSTRIES CORPORATION, 10715 Van Owen St., Burbank, Calif.

tion activities in endographic applications.

**Complete Characteristics**—The new DuPont publication lists up to 22 characteristics for each transducer. Characteristics listed include: function; principle of operation (piezoelectric, capacitance, piezoresistive, etc.); accuracy; response; transfer characteristics (relationship between measured quantity and output signal); power required; amplitude range; sensitivity; output characteristic; bandwidth; input impedance; resolution; sensitivity; weight; range; standard; temperature variations; mounting; size; materials; model designation; and the name of manufacturer.

More than 100 transducers are listed. However, DuPont recognizes that the listing may not be all inclusive, particularly in a fast-growing industry. The company therefore welcomes additional listings.

One section in the brochure gives the characteristics of a variety of available Gage-Medical tubes, used in measuring radio activity. Another section lists electronic medical which describes the use, calibration, and application of various types of transducers.

"A Complimentary to Analog Transducers" can be obtained by writing to the Instrument Division, Allen & DuMont Laboratories, Inc., 1908 Main Ave., Clifton, N. J. The price is 33 cents per copy.



## AVIONICS JUNCTION

This is one of the 1,000 tie topic junction books included in Lockheed's new 1049 Super Construction. Containing 1,500 wires, 400 terminals, plus fast beam and sockets, the structure constitutes every electrical function aboard the aircraft. Interchangeability and rapid, easy removal simplifies maintenance of the aircraft and reduces air time on the ground, says the manufacturer.

## Just Published! JANES 1951-52 Edition ALL THE WORLD'S AIRCRAFT

Lists and figures on both civil and military aircraft of the world.

"Look it up in Janes!"

This great 640-page book is a must for aviators and aviation enthusiasts throughout the aviation world. Book lists in a complete list of data on the aircraft of all nations made possible by the cooperation of manufacturers, airlines, governments, military, naval, and air forces, and other official and confidential sources. Listed all over the globe.

**MILITARY AIRCRAFT** Fully revised and completely up to date, this section of the book gives a complete list of all military aircraft of all nations, including their names, numbers, and other data on (including 1951-52).

**CIVIL AIRCRAFT** Lists the names and addresses of all commercial airlines and their aircraft, including their names, numbers, and other data on (including 1951-52).

**AVIATION ENGINEERS** Provides names of all aviation engineers and their names, numbers, and other data on (including 1951-52).

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Aircraft control linkages, rod and bearings and pulleys are lubricated Clary's own shop to **AN specifications**. We also offer bearing and pulley substitution service to airlines and parts manufacturers.

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## Convair 340 On the Line

With delivery to United Air Lines on March 1 of the first Convair 340, Consolidated Vultee will start putting a dent in its \$50-million backlog for the new 44-seat twin-engine transport. It also can use the backlog for more than 140. While the new Convair-Lear 340 generally follows the lines of the 240, of which 773 were built, the West Coast manufacturer cites a number of its improvements. These include:

- Fuel capacity increase to 1,700 gal from 1,600 gal.
- Longer legs and new auger-type fuel pump for performance.
- Single-section wing instead of the three-section wing used on the 240. This will save weight.
- High activity pump (Hess Standard) with diameter reduced 6 in.
- New certification status for flight deck.
- Reciprocation system which can be operated while plane is on the ground.
- Electrical system designed for easier maintenance.

Power will be supplied by two R&W R.200C-15 engines delivering 2,400 hp each.

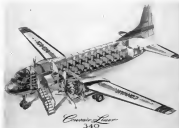
Among the carriers awaiting the new transport are United (40), Chicago & Southern (two more yet ordered for a total of two), Burell, Continental, Mid-Continent, Delta, National, North-east, KLM, Garuda Indonesia, Aerolineas Filipinas, Hawaiian, and Aero A. Y. (Panama). A number have been ordered for exports as well.



**HUGE FIXTURE** is used in assembling the Convair 340 wing in one piece to save weight. Old 240 wing was made in three sections. This 1415' fixture is the largest ever built by Convair for airplane wings.



**MATING TIME** for the 340's one-piece wing comes at the station of the San Diego plant, where the fuselage has been lowered into place by overhead cranes.



**44 SEATS** for passengers in 31 rows are provided in the one plane. Seats for overhead baggage are provided just forward of the cabin.



**FUSELAGE** center section begins taken. Other fuselage sections, ordered in production are nose and tail.



**SPAGHETTI** spread on long board is wiring for 140s new electrical system designed for easier maintenance.



**NEW FLAPS** and auger-type fuel pump will increase performance of the 340. Addition of inboard flaps in the 240's outboard flaps gives extra lift.

**THEY'RE  
ON THE JOB**

For Jet or  
Reciprocating Engines  
Airframe or Test Stand Use

**Thermo Electric  
THERMOCOUPLES**



To reduce run-up time of Test Stand Thermocouples, the Type AC1P Turbo Engine Exhaust Thermocouple is fitted with our Quick Coupling Connector Head.

**Thermo Electric  
ENGINE HARNESSSES**

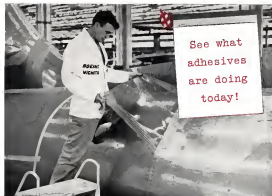
**TURBO-ENGINE MANIFOLD ASSEMBLIES** contain multiple thermocouples to provide for one instrument head. The rapid resistance between any pair of thermocouples concentrates and transmits manifold pressure fluctuating temperatures of individual thermocouples to the average temperature of the entire manifold.

**RECIPROCATING ENGINE MANIFOLD** are designed to check the temperature of each cylinder head thermocouple.

All harnesses are designed and engineered to meet individual engine requirements.

For additional information see Aircraft Products, Send for Catalog Section 73C.

**Thermo Electric**  
100 LOTS NEW STOCK



## "Saving face" for American metal

Did you know that the speed of an airplane can be cut as much as 20 miles per hour by rain and scratches on the metal skin?

Like other aircraft manufacturers, the Boeing Airplane Company was faced with the problem of metal protection. Working with Boeing engineers, 3M developed a strippliable coating which could be sprayed to sheet steel before it started down the production line. This tough, elastic coating effectively protects polished surfaces during handling and landing operations . . . right down to final inspection. Easily removed, this famous 3M strippliable coating has saved Boeing—and other manufacturers—large amounts of time and money by "saving face" of polished metal.

Wherever highly polished metal is used, a 3M strippliable coating can save money by reducing repairs, saving repainting costs and speeding production. These strippliable coatings are another example of an engineered adhesive application from 3M, one of the country's largest producers of industrial adhesives, coatings and sealers.

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It will pay you to investigate the metal-saving possibilities of strippliable coatings. Call your 3M salesman and let him give you the complete story. And for information on all Adhesives, Coatings and Sealers, write 3M, Dept. 112, 411 Piquette Avenue, Detroit 2.



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## Cessna Builds Military Business

A revealing glimpse into how closely the personal plane industry fits into the U. S. military is afforded by studying Cessna Aircraft Co.'s operations during its recently concluded fiscal year.

During fiscal 1951, the Wichita firm's military sales amounted to \$18,869,841, more than the previous year's \$15,016,717. But along with the "guns," Cessna was still disposing plenty of "bells"—commercial aircraft sales also rose up-though not so sharply—from fiscal 1950's \$5,391,127 to \$1,432,677 in 1951.

Hydromatic sales, especially in the fire equipment field, climbed to \$1,574,076 from \$1,038,798, and even though the company discontinued its fire truck operations early in fiscal 1951, sales there came to \$645,731 compared with the previous period's \$582,444.

Cessna net only holds big contracts for Army Field Force's L-19 Bird Dog liaison planes, but also a very active defense subcontracting, producing as yet assemblies for the Boeing B-47 and Lockheed T-33 and T-44. The company will get into production the last part of this year on Republic F-84F components for General Motors. At the end of fiscal 1951, military backlog was about \$82 million.

The company is actively trying the helicopter—early negotiations with Seal Helicopters Co., Inc., also of Wichita, have been completed (Aviation Week Mar. 5, p. 7). Seal had developed a military version of its tri-rotor S4, designated TH 14.

Cessna now operates three plants—in Wichita, Hutchinson and Prospect—and has negotiated several contracts of necessity to make possible further expansion.

The four plane Model 308 has been turned over to the AFM for evaluation. Consequently, the firm dropped the two-plane L-10 line to conserve materials for the higher visibility loss cost 170. Civil sales of the 170 were curtailed because a number of these designated L-170C were diverted to the navy.

## AMC Sets Up New Small Purchase Unit

Dutton-Crosby of a "Small Purchase branch" to draw a large workload from regular processing operations has been organized by Air Material Command at Wright-Patterson AFB.

The new segment will be responsible for processing contracts for "all the stuff" areas with a contract value under \$10,000. Methods of procurement will be similar to that of local effort.

## For JETS and PROPS...



## EX-CELL-O Precision PARTS

ABOVE: Typical precision aircraft parts manufactured by Ex-Cell-O. All details of assembled units were manufactured to Ex-Cell-O's customer specifications.

For more than 25 years Ex-Cell-O has been an important parts supplier to the aircraft industry. Ex-Cell-O precision, a byword in piston-engine and diesel, has been confirmed to play an important role in the development of jet power. Today, leading manufacturers of turbojet engines, turbo-propeller engines and airplanes rely on Ex-Cell-O for precision parts and sub-assemblies requiring unusual accuracy and uniformity of dimensions, finish and hardness.

Since the introduction of jet-powered planes Ex-Cell-O has developed special machine tools for the volume production of compressor parts and fuel system parts and sub-assemblies, including nozzles.

Ex-Cell-O's aircraft parts production facilities are being used now in cooperation with the defense program. If you are working with this program too, perhaps Ex-Cell-O can help you.

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CORPORATION

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MICHIGAN



## SSWhite METAL MUSCLES® give pilots a "boarding house reach"!



ONE of the important aircraft navigational aids is the radio direction finder. Because of necessity, the main elements of this equipment—control unit, radio receiver and loop are often located as much as 20 feet apart. But distance is no problem for the pilot because of the "boarding house reach" afforded by SSWhite flexible shafts. In a typical application two flexible shafts are connected to the control unit at the pilot's station. One shaft, 20 feet long, turns the receiver. The other, 15 feet long, connects the pointers of the control unit to the loop.

SSWhite flexible shafts of both the remote control and power drive types are widely used in aircraft. Their adaptability, simplicity and dependability meet all the requirements of this type of duty.

### SEND FOR THIS 254-PAGE FLEXIBLE SHAFT HANDBOOK

Complete, authoritative information on flexible shaft construction, selection and application. Copy now (send \$1.00) or write us directly on your business letterhead, giving your title. There's no obligation.



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## PRODUCTION BRIEFING

► **Ameson Welding & Mfg. Co.**, Warren, Ohio, has signed an agreement with Warner Machine & Die Co. whereby the latter became a division of Ameson Welding Jan. 1. The transaction gives the parent firm a 5,400-sq.-ft. plant and much personal equipment. Ameson Welding also is adding to its new plant to step up production of jet and piston engine parts.

► **American Helicopter Co.** has occupied a new 15,000-sq.-ft. plant adjacent to its Mechanicsville, Calif., facility. New building will house firm's general office, engineering department and engineering lab.

► **Borch Aircraft Corp.** has concluded a contract to modernize 81 Twin Beech C188 to D188 standard for the USAF. The project will be handled by McDonnell Borch Aircraft Ltd., Wrentham, with Borch engineering support.

► **General Engineering Co.**, Youngstown, Ohio, maker of metal chairs, has secured a large contract to build control seats for Republic F-84 Thunderjets. GE now makes F-84 tail assemblies, will soon make all fuselage sections for that airplane, and will also build ejection and other components for the Boeing B-47. The company has between \$20-\$30 million in defense orders.

► **Natick-Town Laboratory**, Chicago, has moved to larger quarters at 8234 W. Washington Blvd. from 5522 W. Harrison St. The firm specializes in electronic research, design and production.

► **Republic Aviation Corp.** has leased a 210,000-sq.-ft. plant at Monroeville (Post-Washington), Long Island, N. Y., for manufacturing jet fighter wings and other major components. At capacity, the facility will require 2,000-3,000 employees.

► **Val-Wood Mfg. Co.**, Inc., maker of bolts, studs and fasteners, has moved and expanded its plant at 15,000-sq.-ft. production addition to its Cedar City, Calif., plant.

► **Thompson Products Ltd.**, plans to set up a \$4 million factory at St. Catharines, Ont., to build jet engine parts for USAF. The new facility will employ about 600.

► **Chasco Aircraft Division** of United Aircraft Corp. has opened its Dallas employment to a second 5,000.

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Temperature Heat

Hydraulically  
Operated Burner

Hydraulically  
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Quick Quench

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Operating range of the furnace is from 212° F. to 1250° F. with an unflooring of plus or minus 5° F. Heating equipment is of sufficient capacity to bring a 750 lb. aluminum work load, plus a 1000 lb. steel rack, both at room temperature, to 925° F. in 20 minutes when furnace is loaded to operating temperature.

Hydraulically operated furnace doors and elevator are interlocked and automatically controlled from a push button station. They provide for rapid movement of the load to the quench tank.

quench. Speed of quench is considerably less than 10 seconds.

Furnace is heated with 425 KW capacity electric heaters, and type electric burners mounted along each side wall and protected by suitable radiation shields. Two high volume, high temperature air circulating fans assure rapid transfer of heat to parts being processed.

### BE PREPARED FOR GREATER DEFENSE PRODUCTION

For fifty years DESPATCH has pioneered and engineered better, more economical heat treating equipment for leading metal processors throughout the country. To prepare for greater defense production tomorrow by installing DESPATCH engineered equipment TODAY. Send an engineer located at your facility now ready to study your situation and help you with your heat treating problems.

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## HARTWELL FITTINGS



AN 707



AN 708



AN 709



AN 711



AN 712



AN 713



AN 714

**Hartwell Aircraft Fittings** are manufactured to meet all Air Force and Navy specifications. Our modern equipment and plant facilities are tailored for the precision manufacture of the fittings shown at the left, in a majority of sizes. We are constantly looking for additional AN fittings and sizes. Special fittings can be manufactured to your specifications. Our large inventory and plant capacity is an assurance of rapid delivery of all types of aircraft fittings from AN 750 through AN 983 and AN Inco fittings AN 750 to AN 933.

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plus ease of replacement simplify use and maintenance of the device, the manufacturer states.

• **Fracture** machining of parts to be mated is not required when Lock-O-Seal is used.

Class O Seal utilizes Lock O Seals for nuts and bolts to insure better skin joints to thermal sections.

Lock O-Seal for bolts, first of the "O-Seal" line, were used with success on Naval aircraft during World War II and have since been extensively applied to aircraft as well as military planes, according to the Chula Vista, Calif., manufacturer. Recent applications are for glazing fittings and stress cover assemblies.

## Walkie-Talkies Handy in Britain

"Walkie-Talkie" radios are being used at Britain's two airport airports, London and Heathrow, to speed up maintenance, marshaling and loading of widely dispersed aircraft.

Detectors at London Airport, between control centers and the hangar, can be as far as 100 ft. The small portable sets eliminate a lot of lost motion, enabling maintenance men to coordinate work at the place, yet maintain constant touch with the ground engineer and inspectors at control points.

Next extensive use of the self-con-

tained, 15-ft. radios reportedly is at Norfolk where British European Airways engineers have put them to good use in calling up bus spare parts, embodying traffic control the plane is ready for passengers and pushing aircraft to de-ice locations. The sets, made by Messrs. Wireless Telegraph Co. Ltd., who are being supplied to over 100 lines.

Similar equipment made by an American manufacturer is used for the same purpose by Capital Airlines at Wash. region National Airport.

## Lycoming Builds Mobile Power Set

A self-propelled, air-cooled, 36-hp generator set, powered on a standard military Willys Jeep, was recently demonstrated to the armed forces by the designers, Lycoming-Spencer Division of Aero Manufacturing Corp., Wilkes-Barre, Pa.

The Jeep and generator are powered by the most advanced Lycoming O-350-G3 engine. The powerplant's horsepower was pulled from 95 to 125 to insure adequate electrical output at altitude and during hot weather. Generator set drives through speed reduction. The Jeep is designated Model J12B1.

A single J12B1 generator set develops sufficient electrical output to start all jet fighter airplanes, and two J12B1s (or one J12B1 and one Lycoming



## LIGHTWEIGHT BAGGAGE TRAILER

The **FlexiTrack**, a new lightweight baggage trailer, is being marketed by the Taylor Mfg. Co., 1221 El Segundo Blvd., El Segundo, Calif. The Model 11A, described in correspondence with Western Air Lines, is 6 ft. wide and 8 ft. long. Weight

is 410 lb. Lightweight aluminum gear swing upward so units can easily assemble. Aluminum deck has ample provision for drainage. Capacity of being towed at 25-30 mph, the Plymport-based unit can be towed by a jeep and spin pool.

# TEMCO

means

## Aircraft Engineering

Aircraft engineering has been an accelerating force in TEMCO's rapid rise to the first edition of the aircraft industry.

It has taken skilled and experienced aircraft engineering to make possible the versatile achievements of this six-year-old company... volumes and varieties of major modification work such as the TF-51 Mustang two-place trainer conversion and the C-54M Flying Hospital development... new aircraft design with an eye to economy such as the YT-55 TEMCO Buckaroo military trainer... and now completely new military aircraft design of unique concept.

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Texas Engineering and Manufacturing Co., Inc.

DALLAS, TEXAS



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**FLEXIBLE  
film type  
HEATING  
ELEMENTS  
IN TAPE FORM**



**Electro-Flex**

For Cylindrical Heating Applications  
For Temperatures up to 300° F.

APPLICATION PROCEDURE FOR FLEXIBLE TAPE



1. Remove glass side of insulation from pipe with sand or glass block trowel. Strip away tape when hole is to be exposed. Strip away the insulation, strip away the tape when hole is to be exposed.



2. Apply wet cement to exposed surface. Strip away tape when hole is to be exposed.



3. Wrap heating tape around pipe with sand or glass block trowel. Strip away tape when hole is to be exposed. Strip away the insulation, strip away the tape when hole is to be exposed.



4. Monitor glass side of the tape. Strip away tape when hole is to be exposed. Strip away the insulation, strip away the tape when hole is to be exposed.



5. Strip end of tape with sand or glass block trowel. Strip away tape when hole is to be exposed. Strip away the insulation, strip away the tape when hole is to be exposed.



6. Strip end of tape with sand or glass block trowel. Strip away tape when hole is to be exposed. Strip away the insulation, strip away the tape when hole is to be exposed.

Electro-Flex... the answer to heating problems for all cylindrical parts... glass or metal. For Hydraulic hoses, relief valves, pipes, cylindrical valves, etc. ... yes, it's cylindrical and needs heat up to 300° F., then it needs Electro-Flex. Electro-Flex is an electrically resistant plastic material so flexible as cloth, that provides highly uniform heat transfer. (Weights less than 1 lb. per foot & 1/2"). Excellent vibration resistance.



SPECIFICATIONS						
Specification	Width	Weight	Glass/In.	Weight	Length	Weight
Electro-Flex	1/2"	1.00 lb.	0.001"	0.001"	100'	100'
Electro-Flex	1/2"	1.00 lb.	0.001"	0.001"	100'	100'
Electro-Flex	1/2"	1.00 lb.	0.001"	0.001"	100'	100'

**Electrofilm**  
CORP.



7211 LABEL CANYON BOULEVARD • NORTH HOLLYWOOD, CALIFORNIA



ing made C-22 tanks) can be used in parallel to start the engines in the largest bombers such as the B-47, under adverse and hot weather conditions, the company says. The Jap has ample power to tow aircraft when required.

Advantages of the self propelled vehicle over previously used power supply trucks is its high degree of safety, mobility and maneuverability, especially over rough terrain.

## Bendix Buys B-25 To Test Its Products

A purchasing B-25 has been purchased by Bendix Products Division, Bendix Aviation Corp. of South Bend, Ind.

The bomber, lightened by the removal of all armament, will be used to field test wheels, brakes, shock absorbers, steering mechanisms and other units manufactured by Bendix Products.

Laboratory equipment installed aboard the aircraft will enable engineers to record some 3,000 different functions simultaneously in any desired direction, according to F. C. Ahlberg, manager of aircraft loading gear engineering. Among these functions are wheel speed, brake torque and drag load.

Bendix engineer Gordon Powell, a former F-47 pilot, heads up a test group connected with use of the plane.



## OVERHAUL TIMESAVER

2nd Continent Jackson reports a hot speeded engine change by using a full lift truck instead of its overhead beam. "According to the union, the truck saves time, space and overhead, since the plane doesn't have to be repositioned under a hoist each time an engine life is needed, and it is compact and maneuverable for operation in relatively congested areas of an aircraft maintenance shop. Designed specifically for aircraft work, the truck is a Ross Model G-F hydraulically operated full lift of 6,000 lb. capacity.

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# What's doing at JACK & HEINTZ...

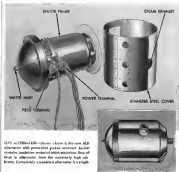
## Successful Vaporization-Cooled Alternator Developed

New J&H G75 Alternator is isolated from environment. Maintains safe operating temperatures at extreme ambient conditions.

Conventional air-blant and fan-cooled generators or alternators have well-known limitations at high speeds and altitudes. At high altitudes, for instance, the quantity of air that can be put through these machines is considerably reduced. In addition, high-speed flight causes a rise in cooling streamlet temperature, which in extreme cases may eliminate the possibility of using conventional blast systems.

Jack & Heintz engineers, with this in mind, have been working for some time on the development of power units offering environment-free operation which, at the same time, impose a minimum over-all penalty on the airplane.

Several units of this kind have been developed by J&H. One of these—the G75 Alternator, utilizes liquid vaporization cooling action. It is the first successful environment-free, water-vaporization-cooled alternator in the industry. Due to an efficiency of about 92 per cent, only 3½ lb/hr of water are required at initial load. Operation is limited to a cycle, de-



G75 ALTERNATOR (3000-10000 rpm) shows the new J&H alternator with protective jacket around. Jacket contains liquid water isolated within. Flow of heat to alternator from the extremely high air heats. Completely isolated alternator is a single.

pendent on the capacity of accompanying coolant reservoir.

In operation, coolant from the reservoir is injected into the alternator's hollow shaft under pressure. As the coolant is distributed throughout the machine by centrifugal force imparted from rotating members, the latent heat of vaporization extracts machine heat lower. Resultant steam is permitted to escape through an exhaust port. Water inlet flow is regulated automatically by a special J&H valve which is controlled by a temperature-sensing element in the alternator.

Conventional alternators, inherently non-isolated from adverse ambient conditions, must be correspondingly derated for the 35,000 to 60,000 feet, and above, altitude range. The G75, a 3-phase, 900-cycle, 15,000 rpm unit, rated at 12 kw, can

deliver 16 kw and maintain satisfactory cooling while operating in extreme conditions of temperature and altitude.

Field power for the machine is taken from the output leads through slip rings and brushes, passed through the rectifier bank and magnetic amplifier of the specially designed G75 EXCITE-Voltage Regulator, and then to the field.

Brush wear problems are minimized in the alternator since the main shaft and brushes, passed through the brushes and slip rings, prolonging brush life.

The G75 Alternator is rated at a power factor of 90 per cent, weighs 38 lbs., is 17½ in. long and 9 in. in diameter. It is an engine-mounted unit with a 5 in. flange diameter and a 5 in. bolt circle diameter, adaptable to an AND 2000 mounting pad.



## ...environment-free alternator

### NEW ALTERNATOR OFFERS ADVANTAGES TO JET AIRCRAFT AND GUIDED MISSILE DESIGNERS

Advantages of the G75 Alternator (3000-10000 rpm):

1. Flow of heat to the alternator is minimized by insulating the stator from the outside shell of the alternator.
2. Heat transfer coefficient for boiling water are 20 to 250 times that for air.
3. High heats of vaporization tend to keep weight of coolant required at reasonably low value (3.5 lb/kwh of losses).
4. For short duration or expendable flights, no control is required beyond a simple on-off act to meet full load cooling requirements. Weight of additional coolant used would, in most cases, be less than the weight of a more accurate control.
5. In certain conditions, water could be kept from freezing by storing in a separate container such as the oil reservoir, or low freezing-point equivalent may be used.



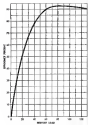
### Chief Engineer's Corner

While we feel that the development of the vaporization-cooled alternator is a definite step toward a solution to the problem of cooling generators on high-speed, high-altitude airplanes, we also recognize that vaporization cooling is not a panacea. Each installation requires careful study to determine the best method of cooling.

Our engineers have completed the development of two additional types of machines. One of these is a high-efficiency air-cooled, d-c machine in which various care, high-temperature materials have been applied to raise the allowable operating temperature. The second, also a d-c machine, has been designed for liquid cooling. In this unit, the coolant is passed through the alternator and brush holders, and around the field windings. These high-speed, high-altitude aircraft are not required to remain aloft as long as in the past, flight duration is a major consideration in determining the best method of cooling electrical equipment. In certain applications, overall system weight and cost may be less if equipment is designed to meet its generated heat rather than to dissipate it.

The experience we have gained in the development of these machines during the past few years has proved invaluable to us.

The benefits of this experience are available to your company. Write for J&H Technical Bulletin No. 1230, Jack & Heintz, Inc., Dept. 305, Cleveland 1, Ohio.



Graph shows efficiency versus load for the G75 Alternator of early power factor.

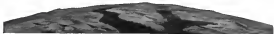
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## NEW AVIATION PRODUCTS



### Seat Tank Sprayer

In the 1952 line of Seacoast aircraft seat sprayers recently announced by Delco Aviation Co., national sales agency for the products, is a special spray installation for the Super Cub and Aeromac Champ.

This is the Seacoast Seat Tank Coat. In effect, it is a 5-gal. spray tank that does double duty as a seat passenger seat. Approved by the Civil Aeronautics Administration, the equipment is said to be comfortable, more roomy than the regular seat and can be installed permanently so that the pilot can carry his own luggage or the faster on inspection tours. It can be used in conjunction with 20 gal. auxiliary tank. A 20-gal. auxiliary tank also can be installed to be used in conjunction with the seat tank.

Other spray equipment being produced by Seacoast this year is a belly tank for the Piper J-3, PA-11 and Super Cub, an 50-gal. inside tank for the four-place Stearman that can be installed with attention to the aircraft and also, a 100-gal. inside tank that can be installed without attention.

Delco Aviation Co., Box 35, Hiram, S. D.



### Pressure Transducer

A new line of pressure transducers for a wide range of aircraft and ground ap-

pliances have been placed on the aviation equipment roster by Rubin Industries Inc.

The units can be used with various gases and liquids to feed pressure information to telemonitoring devices, engine gauges, flight instruments, computers and other equipment. Basic design feature is rigid enough for quantity production methods, yet flexible enough to permit maximum latitude in final design details. They are designed to meet "typical problems involving unusual liquid or gaseous media," Rubin says.

Transducers in this line employ a Bourdon tube. Varying pressures actuate the sensitive diaphragm (Bourdon tube) which in turn actuates the lever in a precision potentiometer to produce a change in the resistance ratio or voltage. The instruments are suitable for gauges, differential and absolute pressure measurement, 0-15 to 0-4,000 psi, per inch differential, 0-15 to 0-2,000 psi, absolute. Standard cover for the transducer are designed to withstand pressures up to 170 psi.

Rubin Industries, Inc., 12 West Broadway, New York 7.



### Jet Speed Switch

A frequency sensitive electronic switch for monitoring jet engine functions, which can be placed to indicate a relay at a selected engine speed, has been developed by Messing, Mervin & Moore.

The device can be used as an inter-switch, through which the engine, as it reaches a certain speed, signals to one of its components or related systems for desired action. For example, the switch can be used to cut in the after burner or change geometry of engine inlet and outlet as dictated by speed. But while primarily for jet engine use, it has broader applications in indicated by its broadly defined name, "Type 2015 Aircraft Speed Switch."

Consisting of a single tube using a Wien bridge type circuit, to assure frequency, the unit allows the advantage of not requiring a separate drive pulley or other mechanical connection to

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the engine to tell its speed. It simply taps into the frequency signal from a standard tachometer generator monitoring engine speed, without affecting performance of the tachometer indicators normally connected to the generator, the two engines. The speed switch drives 1.25 v.a. from the tachometer.

The model shown is adjustable from 58 to 62 cps, with a differential of 2 cps, provides for continuous measuring of the ratio above the set point. For filament supply, it uses 110 v.a.c., 60 cps, current. It will operate through -65 to 200°F temperatures, can be engine mounted if desired, is hermetically sealed and weighs 3 lb.

Manning, Maxwell & Moore, Inc., Stamford, Conn.

### Triple-Duty Tool

A precision saw, stripper-carrier and shile bar, perfecting into light plastic as various parts being produced by the C & G Mfg. and Sales Co.

The small cutting end of the tool is actuated by a lever on the handle. The saw stripper is located at the opposite end of the tool and may be pushed into the handle when not in use. In addition to cutting and stripping, the tool provides a convenient means of holding wires and strands during soldering. This die is standard type kit, says the maker.

C & G Mfg. and Sales Co., Columbus, Ohio

### ALSO ON THE MARKET

"Cone" calculator, a small hand-operated instrument, "Cone," operating a series of dials, large circles and lines, was developed by Swiss watchmakers to "measure portability of a slide rule, with speed and accuracy of a large desk calculator." It weighs half a lb. and priced at \$129, the device costs by five decimal places and totals in 99 billion, performs the electric calculator costing \$600, claims Carter Calculator Co., 5345 S. Ashland Ave., Chicago.

Chromate treatment helps give Kiser Aluminum & Chemical Corp.'s new protective waterproofing tissue for sheet aluminum sheets the power to inhibit water staining. In addition, the paper itself permits aluminum. A company photograph comparing stained and unstained sheet of the new waterproofing, old-style waterproofing, and no waterproofing, was printed upside-down in this section Mar. 3. The actual photo shows the Kiser chromate sheet is giving the most efficient protection. Kiser Aluminum & Chemical Sales, Inc., Oakland, Calif.

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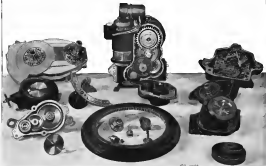
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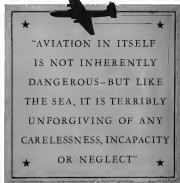


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in the last paragraph. I refer, of course, to the statement that Pan American pilots "have in violation of the airline's contract a government order issued by the Civil Aeronautics Board." This is one of those statements with which we in later years have been given to ponder in the past few years of "the truth, hell and so on." As I have said, I do not question the airline's action but I sincerely feel that by printing only a fraction of the story, you have done the public and long suffering citizen FAA pilots a great disservice in conveying the impression that they are threatening to strike solely as agents of a government order.

The various FAA pilots are threatening to strike about one week which is a capital case for the airline industry. The American World Airways, is deliberately neglecting the provisions of the implement agreement between the company and its various pilots. Whether or not the airline ever does CAA is some other company's body, the important point for all employers is remember that Pan American asked the CAA to attempt to initiate a contract which was entered into in good faith under the terms of the Railway Labor Act, is considered as unfair which at the very least should be taken into by a court of law qualified to render a fair and impartial decision on a matter of such grave impact to the transportation industry.

The agreement concerning the pay and cost of the dispute was where neither would fly without, but I believe it is time to say that the various FAA pilots have made every reasonable effort to resolve the question amicably, including an offer to change their agreement to give former ADA pilots credit for all their service with ADA in its previous American Express Air line, as well as other relevant matters. This offer and an offer to submit the matter to arbitration through the nation of the A-Line Pilot's Union, was fairly received by representatives of the former ADA pilots.

The CAA attempt to give former ADA pilots credit for their service with other airlines dating back to 1937 (including foreign lines) is an indication that even the company admits the scheme is unreasonable. As an example, it would give credit to former ADA pilots for service with the now non-existent Pan American Airways, which line, while various FAA pilots who also served with the company, would receive no credit for such service. Even pilots dismissed by FAA for cause several years ago and subsequently employed by ADA would receive credit for service with FAA in ADA.

I realize that this dispute cannot be argued out in the columns of your magazine but I ask that you post this clarification in order of the minimum engagement which will be spread by the article previously mentioned.

My opinion, of course, on my own, and while I am sure they represent the majority opinion of the various FAA pilots, I do not present them to such. Your publication is a repository of history and I am happy to hope that your office would be so inclined to the nature of printing correct material that you will present some of the thousands of letters received in this.

JOHN M. MARSHALL JR.  
HARRINGTON, N. Y.

A MESSAGE TO AMERICAN INDUSTRY • ONE OF A SERIES

## POINTING the WAY To Continuing Prosperity

The art of figures in the middle of this page is news of high importance to every American.

In effect, it says that there is no basis in fact for all this talk about a collapse of capital expenditures plunging us into a depression following the industrial build-up for defense.

Such talk assumes that without defense orders business would spend relatively little for new industrial plant and equipment. The figures below show that this assumption is not justified.

Profits in 1953, 1954 and 1955, provided the money to carry them out can be obtained.

### A Record in '52

As was expected, their plans call for another record-breaking volume of capital expenditures by business in 1954. But, as many did not expect, the McGraw-Hill survey also discloses plans for very heavy capital expenditures in each of the three years following. Expenditures now planned for these years are, to be sure, lower than those planned for 1952. But the significant fact is that they

BUSINESS PLANS FOR NEW PLANTS AND EQUIPMENT (Millions of Dollars)

	Actual Spending 1952*	Actual Spending 1953*	McGraw-Hill Survey			
			Planned			
			1954	1955	1956	1957
Nonferrous	7,681	12,141	12,940	20,920	8,330	8,194
Mining	484	400	443	401	311	308
Iron and Steel	1,156	1,584	1,640	1,244	1,117	1,092
Electric & Gas Utilities**	2,200	3,876	3,648	5,886	5,264	5,248
Other Transportation & Communications	1,380	1,502	1,721	1,871	1,242	1,220
ALL INDUSTRIES	14,091	18,770	21,175	30,722	15,865	16,161

\*U. S. Department of Commerce

\*\*American World (in McGraw-Hill publication) and American Gas Association

The figures come from the fifth annual McGraw-Hill survey of business plans for new plant and equipment. Companies were asked to report through that survey not only their plans for 1953, but plans they now have in hand for capital ex-

penditures in 1953, 1954 and 1955, provided the money to carry them out can be obtained.

The significant fact is that the expenditures already planned for 1953-55 are so high. For example,

those now planned for 1995 would be higher than those of 1988, which, at that time, were second highest in our history.

If these plans are carried out we shall have an essential element of sustaining prosperity. Sustained expenditures for capital expansion and betterment account directly for a large share of our employment and consumer income. Moreover, consumer modernization of industrial plant raises production efficiency and brings more and better goods and services within reach of more consumers.

It is not to be expected, of course, that we can come down from the peak of the defense boom without readjustments in some sectors of business. But if capital expenditures by business are carried out on the scale now planned, we shall be able to take any necessary readjustments in our stride, and continue to increase our industrial strength.

From V-J Day to the end of this year, manufacturing industries will have spent over \$60 billion for new industrial plant and equipment. This is more than the value of all the plant and equipment these industries had on their books at the end of World War II. It is this heavy outlay that creates some, assuming most previous plans for industrial expansion and modernization will be completed, to fear a collapse of capital expenditure.

#### Plans to Go Ahead

But American industry still has plans to go right ahead expanding and improving its facilities. That was the most striking single finding of this year's survey.\* It disclosed also that after 1992:

- 83 per cent of the companies answering the survey are planning substantial further modernization.
- 48 per cent will need more capacity to make their present products.
- 33 per cent plan additional capacity to make new products.

It cannot be too strongly emphasized, however, that these plans represent what American industry wants to do. They are a concrete expression of hope and aspiration. As such they are extremely important, for they dispose of the idea that business considers the job of expanding and improving its facilities as finished, or anywhere near finished.

But the plans carry no guarantee of accomplishment. If they are to be realized, business must have

the funds to carry them out. There is no assurance that the money will be available if the present level of corporate taxes is continued. Right out of tax companies, according to the McGraw-Hill survey, will rely entirely on profits and reserves to finance their 1983-95 programs. If, in calculating these programs for these years, the companies were asked to assume relief from "excess profits" taxation.

Federal taxes now take at least 33 per cent of a corporation's profits, and 62 per cent of any profits in the so-called "excess profits" bracket. Despite that drain on their funds, companies are able to finance their 1992 programs because (1) they are borrowing heavily, and (2) many of them are getting government loans or special tax concessions on new facilities installed for defense purposes. But these are emergency aids.

#### Only Two Ways

When the present defense program tapers off, there will be only two ways by which business can possibly increase its principal source of funds for new plant and equipment. One way is to make more profits before the tax collector takes his cut. And the only way many companies, already operating at capacity and high efficiency, can do that quickly is by raising their prices. That is an unpopular method. Also, with the return to more competitive markets, it might be self-defeating.

The other way is for the federal government to reduce its strangle hold on business profits. The so-called "excess profits" tax—the 62 per cent tax which is really a tax on business growth—should be repealed, effective January 1, 1993. And a cut in the basic tax of 52 per cent on all corporate profits should come not much later. That is by all odds the most important single step toward ensuring that business plans already made for capital investment in 1993, 1994 and 1995 are carried out. It is the most important single step toward sustaining our present prosperity.

Through its plans for continued expansion and improvement of its facilities, American business clearly points the way to avoid the depression that so many have feared—and the Communists have so ardently hoped—would follow the peak of defense mobilization. It will be a tragedy for our country and for Americans in every walk of life if we do not insist that business get the chance to follow this wise and constructive course.

**McGraw-Hill Publishing Company, Inc.**

\*Note—A copy of the full report of this survey can be obtained by addressing Department of Research, McGraw-Hill Publishing Co., Inc., 325 West 42nd St., New York 36, N. Y.

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### Air Force Wing

Before the Air Force received autonomous status in September, 1955, it had operated as a combat group. Today it is the wing.

Formerly a combat group, the Air Force has been reorganized into a wing and support force. Under the present arrangement, the Air Force is a combat group in the air and a support force on the ground.

- Wing has four main subdivisions:
  - Combat Group—containing all the wing's combat aircraft
  - Maintenance and Supply Group
  - Air Base Group
  - Medical Group

When a combat group is transferred, all the other groups move with it. The wing commander automatically takes command of and completely staffs the new air base, of which his combat group is usually a separate unit. Only one or two maintenance organizations from a combat group move to the new base.

While maintenance organizations—combat group personnel—move to a new base, it is supposed to spend an equivalent of money. Assets and ground crew units, together from the start. The method and air base groups function there with the particular needs of their unit.

An activated wing is presumably a self-sufficient unit, capable of rapid delivery in its command. The unit "retail" need required to develop a big operation at the base.

When organization is still under revision. That pattern has not been set. But it seems as if the single unit structure is a permanent move.

Aviation Week, 3-24-57

## Employment Figures U. S. Scheduled Passenger Carriers

Year (Jan. 1)	Total	Intercontinental	Domestic	Foreign	Other	All others
1956	1,200,000	1,000,000	200,000	0	0	0
1957	1,200,000	1,000,000	200,000	0	0	0
1958	1,200,000	1,000,000	200,000	0	0	0
1959	1,200,000	1,000,000	200,000	0	0	0
1960	1,200,000	1,000,000	200,000	0	0	0
1961	1,200,000	1,000,000	200,000	0	0	0
1962	1,200,000	1,000,000	200,000	0	0	0
1963	1,200,000	1,000,000	200,000	0	0	0
1964	1,200,000	1,000,000	200,000	0	0	0
1965	1,200,000	1,000,000	200,000	0	0	0
1966	1,200,000	1,000,000	200,000	0	0	0
1967	1,200,000	1,000,000	200,000	0	0	0
1968	1,200,000	1,000,000	200,000	0	0	0
1969	1,200,000	1,000,000	200,000	0	0	0
1970	1,200,000	1,000,000	200,000	0	0	0
1971	1,200,000	1,000,000	200,000	0	0	0
1972	1,200,000	1,000,000	200,000	0	0	0
1973	1,200,000	1,000,000	200,000	0	0	0
1974	1,200,000	1,000,000	200,000	0	0	0
1975	1,200,000	1,000,000	200,000	0	0	0
1976	1,200,000	1,000,000	200,000	0	0	0
1977	1,200,000	1,000,000	200,000	0	0	0
1978	1,200,000	1,000,000	200,000	0	0	0
1979	1,200,000	1,000,000	200,000	0	0	0
1980	1,200,000	1,000,000	200,000	0	0	0
1981	1,200,000	1,000,000	200,000	0	0	0
1982	1,200,000	1,000,000	200,000	0	0	0
1983	1,200,000	1,000,000	200,000	0	0	0
1984	1,200,000	1,000,000	200,000	0	0	0
1985	1,200,000	1,000,000	200,000	0	0	0
1986	1,200,000	1,000,000	200,000	0	0	0
1987	1,200,000	1,000,000	200,000	0	0	0
1988	1,200,000	1,000,000	200,000	0	0	0
1989	1,200,000	1,000,000	200,000	0	0	0
1990	1,200,000	1,000,000	200,000	0	0	0
1991	1,200,000	1,000,000	200,000	0	0	0
1992	1,200,000	1,000,000	200,000	0	0	0
1993	1,200,000	1,000,000	200,000	0	0	0
1994	1,200,000	1,000,000	200,000	0	0	0
1995	1,200,000	1,000,000	200,000	0	0	0
1996	1,200,000	1,000,000	200,000	0	0	0
1997	1,200,000	1,000,000	200,000	0	0	0
1998	1,200,000	1,000,000	200,000	0	0	0
1999	1,200,000	1,000,000	200,000	0	0	0
2000	1,200,000	1,000,000	200,000	0	0	0
2001	1,200,000	1,000,000	200,000	0	0	0
2002	1,200,000	1,000,000	200,000	0	0	0
2003	1,200,000	1,000,000	200,000	0	0	0
2004	1,200,000	1,000,000	200,000	0	0	0
2005	1,200,000	1,000,000	200,000	0	0	0
2006	1,200,000	1,000,000	200,000	0	0	0
2007	1,200,000	1,000,000	200,000	0	0	0
2008	1,200,000	1,000,000	200,000	0	0	0
2009	1,200,000	1,000,000	200,000	0	0	0
2010	1,200,000	1,000,000	200,000	0	0	0
2011	1,200,000	1,000,000	200,000	0	0	0
2012	1,200,000	1,000,000	200,000	0	0	0
2013	1,200,000	1,000,000	200,000	0	0	0
2014	1,200,000	1,000,000	200,000	0	0	0
2015	1,200,000	1,000,000	200,000	0	0	0
2016	1,200,000	1,000,000	200,000	0	0	0
2017	1,200,000	1,000,000	200,000	0	0	0
2018	1,200,000	1,000,000	200,000	0	0	0
2019	1,200,000	1,000,000	200,000	0	0	0
2020	1,200,000	1,000,000	200,000	0	0	0
2021	1,200,000	1,000,000	200,000	0	0	0
2022	1,200,000	1,000,000	200,000	0	0	0
2023	1,200,000	1,000,000	200,000	0	0	0
2024	1,200,000	1,000,000	200,000	0	0	0
2025	1,200,000	1,000,000	200,000	0	0	0
2026	1,200,000	1,000,000	200,000	0	0	0
2027	1,200,000	1,000,000	200,000	0	0	0
2028	1,200,000	1,000,000	200,000	0	0	0
2029	1,200,000	1,000,000	200,000	0	0	0
2030	1,200,000	1,000,000	200,000	0	0	0

INTERCONTINENTAL									
1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
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1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
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1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
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## AIR TRANSPORT

# Airlines Test CAB Life-and-Death Power

- Western and United open court fight on Board order suspending service to points served by other lines.
- They say the basic issue is not those routes, but the permanency of all their certificates.

Can the Civil Aeronautics Board compel an airline to stop serving a city, or a route it deems to be permanently "congested"?

CAB says yes. But United and Western Air Lines are prepared to go to the U.S. Supreme Court if necessary to defeat this CAB contention.

The airlines filed briefs this week in the U.S. Circuit Court of Appeals in San Francisco asking the court to rule that CAB does not have the power to suspend a permanent air certificate unless the violation of the Civil Aeronautics Act is egregious.

• **The Real Issue**—This is the opening gun in a case that will set a precedent for the future question of whether CAB can at least change the status of a certificated airline at will. United and Western fear that if the Board can just throw out at the last moment at least one route, it can force the airline to a permanent ending of the Board to take them out of more important routes.

Once the precedent were to be established, the airlines contend, their route investments would be jeopardized.

The specific cases of Western and United v. CAB are:

- Western service to Yreka, Ariz., and El Centro, Calif., was ordered suspended by CAB, which is demanding Western to serve those points within Western now a 20-day stay against the order in court, and United has filed a brief "amicus curiae" (friend of the court).
- United service to Santa Barbara, Monterey, Red Bluff and Eureka, Calif., was suspended by CAB because Southwest Airlines serves those points. An order of Board order would suspend UAL service to Santa Barbara, Wyo., also served by Frontier Airlines. In the U.S. Court of Appeals in Chicago, United won a stay of both these orders, the California order until June 1.

Four detailed arguments over the basic issue at stake in these cases appear in the briefs both filed by United and Western in the California court and in the CAB motions requesting their service to the towns suspended.

CAB is determined to prove its power to suspend certificates at the airlines sue to disprove it. As one Board attorney put it: "The Board presumes the Board is right." The Western case is in the San Francisco court, and/or the United case to Chicago court will be a long step toward settling the question of how the CAB can go with its suspension power. This issue has never been raised through the courts before as previous suspensions have been voluntary, or else the airlines did not take the CAB to court because of the costs.

Both CAB and airlines attorneys told Aviation Week that the main question involved is Can CAB suspend a certificate in "the public interest"—a phrase with no question of the airline's fate? If so, can the Board only make little changes in the route pattern of a certificated line or can it suspend whole route segments?

• **CAB's Case**—The Board is its opinion on the Southwest request. United suspension case adopted the reasoning of Revenue Paul Pfeiffer on the issue of whether it was the Board's power to suspend. United took the four CAB legal issues.

Congress granted CAB power to do so in Section 401(11) of the Civil Aeronautics Act. Pfeiffer stated: "The pertinent clause is 'The Authority may, after notice, suspend or suspend any such certificate, in whole or in part, if the public convenience and necessity require.'"

Then Pfeiffer cites a previous court ruling at precedent for broad interpretation of the Board's power under 401(11): "The power of the Board to suspend a certificate is subject to the right of a certificate holder to operate a service of a company not affected by the Court of Appeals for the District of Columbia in Pan American Case v. Civil Aeronautics Board in the following California case: It is clear from this opinion that the Board had the power, after notice and hearing, to grant PanAm's petition and to suspend its certificate, subject to the final order of the court." (However, the Board decided not to suspend PanAm.)

Finally, the court concludes that, being no property in a certificate of convenience and necessity in itself, and a function of suspension, is subject to modification.

• **Congress' Case**—Western's brief in the California court, supported by United's motion clause, puts a different interpretation on section 401(11).

The airlines contend that the CAB suspension order is not a temporary suspension of the meaning of the Act, but in effect a revocation. They point out that as the Honorable Justice Brandeis has no intention of restricting Western on the route the Board is transferring to Hawaiian. And the Act says CAB cannot issue a certificate except "the substantial public convenience with any provision" of the Act or regulations.

Second, the airlines say the suspension power granted in 401(11) is not only temporary but also too recent to Congress to cover only circumstances such as "light" towns which no longer need to be served for public convenience and necessity.

Third, the airlines contend that even if the Board could suspend a certificate indefinitely, that would be a violation of the Fifth Amendment (due process clause) of the Constitution if there were no compensation for the loss. They claim that there are three property losses involved in an indefinite suspension of the route.

- **First losses** occurred while building up the route losses that can never be recovered if the route is taken away.
- **Future profits** inherent in the present route to profitable operation of these routes.
- **The physical assets** tied up on the operation.

These are among the chief arguments of the airlines.

• **Temporary, Not Permanent**—CAB's answering brief is expected to refer shortly to the letter of the Civil Aeronautics Act. The suspension of the certificate is not a revocation. No one can assume that the Board will continue the suspension forever. Technically, it is only a temporary suspension, and it is in what the Board believes best for the public interest.

Overlook is for a time, last court. United President W. A. Patterson is well-known for holding to a principle in which he believes. He intends to make this the test case as a principle.



EXTERIOR VIEW of Pan Am DC-6B looks into air cabin to passengers flying in.



INTERIOR VIEW shows a different kind of plane with high-density seating, new seats.

## PanAm Shows Off Its Ocean Coach

New 82-passenger DC-6B put on Bermuda route until Atlantic service opens. It may set pace for ocean run.

A Bermuda test from Atlantic as trans service started taking a while and competition stepped in.

Ever worked from one until May 1 and perhaps successfully after that Pan Am's Atlantic service is now being tested on the Atlantic route. The DC-6B will be the primary transport to Bermuda for 505 flying time. The DC-6B will be used on Pan Am's trans-Atlantic service (B15) connecting New York-London. They will be the only new, designed for the primary transport on the trans-Atlantic route.

• **The New Service**—The Bermuda service is going Pan Am's closest to gauge passenger acceptance of its new plane, passengers a chance to see how they

might like a 13 hr. ocean flight in a brand new plane, and the flight a chance to see how the DC-6B compares to the DC-6B.

The DC-6B competition on the Bermuda route is in Panama City. The DC-6B will meet the same type planes plus the Constitution. It will have a speed advantage over the Constitution, but passengers on the Constitution, but with perhaps a small service to the West.

On a one-day service flight to the

route, Pan Am's "Liberty Bell" clipped from New York to the Atlantic island in 13 hr. 12 min. with a 56-mph cruise and a 150 mph climb. The plane had a 40-mph. headwind, completing the trip in 5 hr. 29 min. at a ground speed of 210 mph. A DC-6B flying to New York at the same time required 4 hr. 36 min. The Pan Am plane flew at a 16,000 ft. altitude. The DC-6B at 16,000 ft.

• **What Happens Next?** Last year, Pan Am's current 64,616 passengers both east New York-Bermuda. Almost one-half went coach. Pan Am's only U.S. competitor, Colonial, flew 44,617 passengers both ways. Colonial operates on daily 72-passenger DC-6B. But the plane, of the 1951 coach-type layout. Considering Pan Am's greater resources and greater competition, Colonial has done well.

Colonial feels it will continue to thrive, despite the competition of the Super-6 President Bush 7. Dyer told Aviation Week, "We welcome competition. Our Bermuda business continues to show big gains (75% gain in 1951 over 1950), and we feel that our Montreal-U.S. domestic route setup, making it possible for us to pass on to London, may become possible as well as Canada on one plane to the Montreal terminal and then to Bermuda, gives a real advantage."

To start about, Pan Am shows that the Vice President, William Randolph Hearst, to Colonial's advertising a coach but in Pan-Am planes, and to its domestic routes as the reason why Colonial will remain a strong competitor.

• **Effect on Atlantic**—The future to a certain degree will also influence the flow of trans-Atlantic coach traffic. TWA and Trans-Canada on this coast have strong domestic routes to feed their trans-Atlantic flights, and in the bargain, TCA will operate only on the Atlantic in this class planes. Moreover, almost every foreign competitor can rely on business from domestic routes and must also operate only on the Atlantic. But Pan Am's DC-6B, specially designed for coach, may shift these competitive facts.

## New Alphabet Code Effective Apr. 1

The CAA has set Apr. 1 for suspension of the U.S. of the new international alphabet adopted recently by the International Civil Aviation Organization (Aviation Week Jan. 14, p. 70). However, CAA has set the new alphabet is not mandatory for pilots unless the U.S. is on domestic flights. But applies by CAA's question will use the international code exclusively after Apr. 1.







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P-385, Aviation Week  
120 N. Michigan Ave., Chicago 11, Ill.

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Applicants should give full details experience and salary range and will be kept strictly confidential.

P-386, Aviation Week  
120 N. Michigan Ave., Chicago 11, Ill.

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Parts of Every Nature!

Sanford Corp. & Limited Corp. have been buying and selling surplus aircraft parts for over 25 years. We have a large inventory of surplus aircraft parts for sale. We are looking for parts for the following aircraft: AT-6, SNJ, NAA, Harvard, T-6, T-28, T-44, T-47, T-48, T-49, T-50, T-51, T-52, T-53, T-54, T-55, T-56, T-57, T-58, T-59, T-60, T-61, T-62, T-63, T-64, T-65, T-66, T-67, T-68, T-69, T-70, T-71, T-72, T-73, T-74, T-75, T-76, T-77, T-78, T-79, T-80, T-81, T-82, T-83, T-84, T-85, T-86, T-87, T-88, T-89, T-90, T-91, T-92, T-93, T-94, T-95, T-96, T-97, T-98, T-99, T-100, T-101, T-102, T-103, T-104, T-105, T-106, T-107, T-108, T-109, T-110, T-111, T-112, T-113, T-114, T-115, T-116, T-117, T-118, T-119, T-120, T-121, T-122, T-123, T-124, T-125, T-126, T-127, T-128, T-129, T-130, T-131, T-132, T-133, T-134, T-135, T-136, T-137, T-138, T-139, T-140, T-141, T-142, T-143, T-144, T-145, T-146, T-147, T-148, T-149, T-150, T-151, T-152, T-153, T-154, T-155, T-156, T-157, T-158, T-159, T-160, T-161, T-162, T-163, T-164, T-165, T-166, T-167, T-168, T-169, T-170, T-171, T-172, T-173, T-174, T-175, T-176, T-177, T-178, T-179, T-180, T-181, T-182, T-183, T-184, T-185, T-186, T-187, T-188, T-189, T-190, T-191, T-192, T-193, T-194, T-195, T-196, T-197, T-198, T-199, T-200, T-201, T-202, T-203, T-204, T-205, T-206, T-207, T-208, T-209, T-210, T-211, T-212, T-213, T-214, T-215, T-216, T-217, T-218, T-219, T-220, T-221, T-222, T-223, T-224, T-225, T-226, T-227, T-228, T-229, T-230, T-231, T-232, T-233, T-234, T-235, T-236, T-237, T-238, T-239, T-240, T-241, T-242, T-243, T-244, T-245, T-246, T-247, T-248, T-249, T-250, T-251, T-252, T-253, T-254, T-255, T-256, T-257, T-258, T-259, T-260, T-261, T-262, T-263, T-264, T-265, T-266, T-267, T-268, T-269, T-270, T-271, T-272, T-273, T-274, T-275, T-276, T-277, T-278, T-279, T-280, T-281, T-282, T-283, T-284, T-285, T-286, T-287, T-288, T-289, T-290, T-291, T-292, T-293, T-294, T-295, T-296, T-297, T-298, T-299, T-300, T-301, T-302, T-303, T-304, T-305, T-306, T-307, T-308, T-309, T-310, T-311, T-312, T-313, T-314, T-315, T-316, T-317, T-318, T-319, T-320, T-321, T-322, T-323, T-324, T-325, T-326, 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level represented persons in high positions at the expense of qualified technical personnel who do not play politics.

To give some concrete examples in Figure 2, I would like to refer back to the qualifications record and background of the Chief of Technical Air Carrier Operations. It seemed that he obtained his airline transport certificate from an instructor and has acquired the experience of knowledge to qualify for such a rating. It is an understanding that this man first joined in 1945 on a Ford 34, and all flying experience since that date has been obtained within CAA. This man is in charge of aviation safety for scheduled and air carrier operations.

#### NO CIVIL EXPERIENCE

The newly appointed Chief of Aviation Safety, Region 2, seemed to fit the bill. He had been with CAA for three years or so and was an air carrier pilot. He had previously an experience in civil aviation. Yet he is the man who sits the policies concerning all seven phases of the operation with which he is concerned as well as the scheduled air carrier. I believe his experience in these eight divisions were decided that his qualifications would serve very few, for this position.

It is not stated that if a thorough administrative investigation were to be made, the names of some persons would be found with the appointment of high level policy making personnel.

Of course, other factors are involved. It is no opinion that the cause of confusion could be, and should be, determined by consultation within CAA and certainly to include the technical people who know what makes airplanes operate and fail. Through our own investigation we have found that in Region Two, only one person in the past few years has been promoted. The others have been offered to be promoted in the investigation of the cause of any aircraft accident, including scheduled air carrier.

The issue is true with respect to major aircraft repair and alterations. The person who gives the Maintenance Unit authority for approving anything is one to require regardless of his qualifications, his experience or "know how" without even asking the Engineering Dept. with those regarding errors available. It is true that at least an agent will call upon them for help; this being more so in un-scheduled than in scheduled air carrier operations. I do not believe that this confusion exists in all areas, however, and some people within these hours have and take advantage of the technical services available to them within the organization. But there is no aviation personnel.

#### STEP TOWARD LICENSING

The people who headed this organization of CAA have not been stepped on the toes of us in the industry and the people within CAA must also not play politics, but must also try to get into the dissonance with and within of our government. I say this because I know that in many cases Civil Service Engineers are not given a chance for promotion or a chance to look on better jobs as compared to Civil Service Pilot positions. I can recall several years ago that because I believe it is a step in the direction of a dissonance.

The recent reorganization of Aviation Safety is obviously a loss to increase the number of individual dissonances, to include the Aviation Safety Division with those who will support these persons in power at the expense of them and away of the industry.

The method of examining and selecting top level personnel under the present administration of Aviation Safety (which is a bit in the subject of the U. S. government), research is no doubt, believe that the examination is required and the quality they will be based on examination to select by a fair method, honest and qualified personnel to carry out a reliable safety program in aviation.

I hope your position will have done an investigation of the entire Aviation Safety Organization of CAA, and that it will be required enough to put the blame where it belongs and that those people who can meet about person and career, that the best of people get what they deserve and that give to those within CAA who have held themselves above playing politics a chance to better themselves.

An Official of a Leading Operator in the Southeast

### From CAA's Third Region

You certainly have my sincere support... on the subject of reorganization of CAA's Office of Aviation Safety. The people who do the small field operations, such as myself, I have been because of politics in CAA is an odd one. I have been under a very one-sided and biased perspective, the past year, because of the small time politics that is being played in the lowest levels of CAA.

It is a long story that can be briefly told in the fact that I am an individual would not involve order to the best interests and felt that I had a right to say my right to the respect others with out going through the district office. This action avoided the best from the district office for the time.

I preferred, and will continue to do so, that the CAA and those people in it serve more than individuals and when the time comes that you have to play the part of a politician just to get along with those I do not care whether I get along with those or not. Stay with your light and aviation industry we will have a good body of CAA personnel, and can get some and things done for the flying public from those in the aviation business driven to be part operators.

An Executive in an Aircraft Repair and Assembly Manufacturer in the Third Region

### Can Hensley & Davis Answer?

If the reorganization of CAA's Office of Aviation Safety last month was not purely business to build the careers of Ernest Hensley and William Davis, let them answer these questions:

1. How much did the OAS reorganization cost and why was it necessary? We have heard cost estimates from \$30,000 to \$100,000. An Aviation Week query to Ben Stern, CAA information chief, brought the statistics: There's no way to tell. Mr. Hensley has an administrative officer who knows Mr. Hensley and Mr. Stern know this man knows. Why the mystery?

2. Why were both Civil Service and CAA's own costly national promotion plan only partly utilized in making top appointments in the reorganization? Our answer is that Hensley & Davis could not have regarded the reorganization with only those two sets of rules.

3. Why were no transcripts kept of the individual or group examination sessions? Especially since the group interview consisted up to 50 percent of the grade and the individual interview amounted up to 20 percent, under the Hensley-Davis grade system. Then, about half of the individual's final "grade" depended on the examinee's unaided opinions, reached in closed sessions, without any recording record of proceedings.

4. Why were some individuals who got low grades told they could have some "favor" if they presented aid to protect basically their new assignments? Did Hensley & Davis fear a precedent-setting formal protest because it would go to Civil Service and might start investigations of the entire OAS plan?

5. Why were Civil Service veterans' rights involved in notifying those with low grades that they would be transferred or dropped?

6. Why were both continuing tests conducted by the top officers of OAS and by those who were regarded the "show" Mr. Hensley led one team, Mr. Davis led the other.

7. Is it true that the area establishes an additional Civil Service Grade 14 (Chief, Aviation Safety Division) in each region? Is it true the base salary of a Grade 14 is \$98,000, or an additional total cost increase to the taxpayer of \$68,000 for these new Hensley-Davis hand-picked team?

—Robert E. Wood

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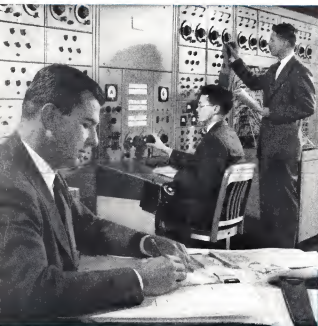
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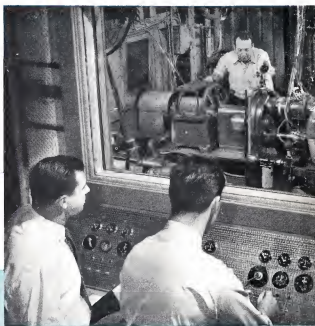
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